ACTION, INTENTION AND LANGUAGE: A DAVIDSONIAN STUDY

Philip Mark Roberts

PhD

University of Edinburgh

1988

Acknowledgements

I owe a great deal to my principal supervisor, Robin Cooper, and my second supervisor, Jon Oberlander. Robin Cooper has provided valuable assistance, instruction and guidance on all areas. As a result of Jon Oberlander's constructive criticism of later drafts, I was able to make considerable improvements to the thesis. Thanks are are also due to David McCarty for his help during the early stages of the research. Finally, I have benefited from the advice and criticism of Jennifer Hornsby, Geoffrey Madell, John Slaney and Bradley Franks.

The research was carried out while I was in receipt of a Doctoral Programme Award from the Economic and Social Research Council.

Declaration

I declare that this thesis has been composed by myself and that the research reported therein has been conducted by myself unless otherwise indicated.

Philip Roberts

21 December, 1988

Abstract

This thesis is concerned with the incorporation of ascriptions of intentional and complex action into a framework based on the work of Donald Davidson. The attributions of action and intention which the thesis addresses, and which were beyond the scope of Davidson's original proposals, can be made in a number of characteristic ways, e.g. "x f-ed by g-ing", "x f-ed deliberately", "x f-ed in order to g", "x intended to f". Since many of these involve adverbial modification, the standard Davidsonian account of adverbs is extended and modified. In pursuing this objective, an interpretation and assessment of Davidson's contribution to the philosophy of language and the philosophy of action is made. In addition, by endorsing an action theory and implementing it in the study of the semantics of action reports, a perspective is gained from which to carry out an informed examination of theories of action representation in other disciplines.

The presentation can be divided into four parts. The first, Chapter One, examines the relationship between logical form, semantics and metaphysics, and broadly characterises the thesis in these terms. The second part, Chapters Two and Three, examines the Davidsonian apparatus for representation. Chapter Two discusses the theory of adverbial modification and goes on to classify and endorse a theory of events. Chapter Three casts doubt upon Davidson's paratactic manoeuvre for dealing with intensionality, and supports a conditional assignment method of accommodating demonstrative constructions. Chapters Four and Five deal with theoretical considerations of human action. Chapter Four describes a theory of action and isolates and proposes a treatment for a locution (the "by"-locution) which is central to any account of action. Chapter Five recognizes a distinction in the study of intention and puts forward an account of refraining. Finally, Chapters Six and Seven address representational issues in the light of the preceding chapters. Chapter Six proposes logical forms for target expressions, while Chapter Seven discusses the representation of action in Psychology and Artificial Intelligence, and proposes a different schema based on earlier considerations.

Contents

Introduction

1. The Scope of the Thesis

1.1. General

The main objective of the thesis is to incorporate ascriptions of intentional action and complex activity into a framework based on the work of Donald Davidson. The attributions of action and intention with which the thesis is concerned can be made in a number of ways, for example, "x intended to A", "x A-ed deliberately", "x A-ed by B-ing", "x A-ed for the purpose of B-ing". In the course of providing satisfactory representations of these ideas, the thesis will endorse a theory of action and evaluate representational apparatus.

The thesis has a number of aims in addition to this goal. First of all, it is intended to be a study and interpretation of Davidson's work in the areas of natural language semantics, metaphysics, and the philosophy of action. By pursuing the objective outlined above, there will be an opportunity to provide a critical assessment of Davidson's philosophy. Since, for the most part, the project inclines to the semantical, the sort of metaphysics that will be of interest to us will relate directly to the study of language. It is not accidental that different aspects of Davidson's work are compatible: we might say that he has developed a *system*, the components of which interact and co-evolve. The use of "metaphysics" throughout will probably not coincide with its use in relation to semantical projects of a different stripe, e.g. we shall not be concerned with possible worlds in this respect. The meaning of the term will become clear as we proceed. An examination of certain central tenets of Davidson's work, and of appropriate reactions to it, will allow us to evaluate the contribution that has been made by this characteristic approach. Two aspects of Davidson's system which have resulted in widespread debate are his proposals regarding actions and events, and his paratactic manoeuvre for dealing with intensional contexts. We shall accept part of what is said about events and actions, but abandon Davidsonian parataxis as a general method for dealing with troublesome constructions. The discussion of parataxis will lead to consideration of the accommodation of demonstrative constructions. The action theory to be endorsed will take to heart the idea that an action can be interpreted in a number of different ways.

The present evaluation of Davidson's Programme does not set out to discover whether possible worlds semantics, situation semantics or "Davidsonian semantics" is the

best theory of meaning. It is quite possible that each is pursuing a different goal, and that they may not be strictly comparable. However, since possible worlds semantics is usually judged to be the "nearest competitor", and because its advocates have thought that "Davidsonian semantics" cannot account for a large amount of data, it will be necessary to look briefly at both approaches in the first two chapters.

As mentioned, in addition to critical assessment, an important goal of the thesis will be to attempt to extend a Davidsonian framework to enable it to accommodate phenomena which were beyond the scope of the original proposals. This extension will be possible because of modifications made in the light of the previous examination and characterisation of the Davidsonian Programme. The principal extensions which are to be made concern sentences which express, or pertain to, complex and intentional action. An important example of complex action will be identified and characterised. When talking of complex action, I have in mind reports of action from which it is not clear whether an agent has performed only one action (or it is not obvious how to represent any additional information that we are given about an action). Complex activity, then, involves apparent multiplicity of actions. The relevant sentences contain constructions which provoke debates concerning the identity of action and the relationships between actions. Since such constructions are generally adverbial, advantage is taken of Davidson's proposals regarding the treatment of sentences which contain adverbial modification. The simplicity and potential generality of these proposals (together with their being "semantic arguments" for an ontology of events) are important reasons for wanting to build upon them. It is noticeable that Davidson does not give any explicit proposals for the treatment of intentional adverbs. The thesis will attempt to fill this gap. In addition, attributive adverbs are beyond the scope of Davidson's original inquiry — tentative suggestions will also be made concerning the treatment of this class of expressions.

As well as suggesting what the logical forms of a certain class of sentences look like within a Davidsonian framework, the thesis contains a proposal about the nature of refraining from action and its relationship to intentional action. It is important to explore certain, broadly philosophical, issues in order to be able to characterise the behaviour of expressions in logical form. The question of the proper treatment of refraining and of reports of "intentional omissions" within a cohesive framework is often touched upon in the literature but seldom addressed. This question is explicitly addressed in the course of the thesis.

Having evaluated, modified and extended the Davidsonian framework, an attempt is made to employ insights gained in the examination of related work on human action in other disciplines. A principal concern will be the structure of cognitive representations of human action. By the time we come to this work, we will have a stock of well-articulated

ideas which will form a perspective of the area. A fusion of linguistic, semantical and philosophical interests result in a framework or point of view from which to explore related topics. It is hoped that, by looking at other work, further hypotheses will become available for testing, and that this could form the basis of future research. Taking a broad view, the thesis develops a theory of action, which, having been semantically deployed, enables an assessment of further theories of the representation of action.

There has recently been a recrudescence of interest in Davidson's philosophy. A number of volumes of papers have been published both elaborating and criticising his ideas (LePore and McLaughlin 1985, LePore 1986, Vermazen and Hintikka 1985). These are primarily in response to the two volumes of collected papers by Davidson (Davidson 1980, Davidson 1984). The interpretation and extension of Davidson's work which is presented in this thesis is based on material in those volumes. It is noticeable that in a recent anthology, which is concerned with new directions in semantics (LePore 1987), many of the contributions are reactions to or extensions of Davidson's work. The interest which these publications and others represent places this thesis within the context of a current debate. In addition, there has recently been a concern, both in philosophy and in other disciplines contributing to the cognitive science environment, to formulate coherent theories of human action. In this respect, too, the present project is apposite.

1.2. Specific Problems

As indicated above, the thesis addresses problems affecting a Davidsonian approach to adverbial modification, and its accompanying theory of events. One of the goals is to provide an account of those constructions, most of which are adverbial, which have been thought to lie beyond the scope of this approach. The expressions with which we are concerned mark a departure from "simple" action language, which reports "primary purposive doings" (Gustafson 1986: 18). For example, primary purposive doings are not learnt as actions for the sake of further purposes, or as executed first-person intentions. In Wittgenstein's terms, the vocabulary of intentional, purpose*ful* or sophisticated activities represents a new move in the "language game".

In order to give the reader a foretaste of what difficulties do face the "Davidsonian Programme", there follows an outline of some specific problems which have arisen mainly from criticism of the framework that we are adopting.

In his original proposal for adverbs, Davidson does not give a treatment for two classes of adverbs (Davidson 1967a). These are attributive adverbs and intentional adverbs. The former includes most adverbs of manner, like "slowly"; the problem is that they seem

to introduce relativity which is not covered by Davidson's original account. For example, an event is not slow simpliciter, but is slow relative to something. In the case of intentional adverbs, an intensional context is created: if Brown is Smith's bank manager but Smith does not know it, Smith may kill Brown intentionally, but may not mean to kill his bank manager. The problem arises of whether we are to say that killing the bank manager is the same event as killing Brown.

The problem of identifying events is even more pressing than that of identifying individuals when it comes to giving an account of adverbial modification. For example, if I cross the channel by swimming it, then the question arises of whether the crossing is the same event as the swimming or whether they are distinct. The phrase introduced by "by" appears to be doing an important job: it introduces a certain amount of complexity into our attributions of action. The problem of how this is to be represented in the underlying representation of sentences containing it has not been satisfactorily addressed. To return to the question of attributive adverbs, my swimming of the channel may be quick, but the crossing slow. If they are the same event, then, in an unrefined analysis, we may be committed to one event being both quick and slow.

There are other adverbial constructions which have been thought to defy a Davidsonian theory, yet are accommodated within other accounts. A sentence like "Reluctantly, John bought gas and had the oil changed" has two readings: it either means that John reluctantly performed the first action and reluctantly performed the other, or it connotes that John would have been willing to do either separately, but disliked doing both. Another example which has received much attention is "John painstakingly wrote slowly". Again, there are two readings: it can mean that John wrote painstakingly and he wrote slowly, or it means that writing slowly was what John took pains to do. These examples need to be accommodated by a theory which allows both readings to be represented. Apart from a brief mention, "non-standard" intensional modifiers like "allegedly", which preclude adverb-dropping inferences, will not be dealt with.

Mention will be made of adverb-quantifier examples like "Harry gracefully ate all the crisps", where it is ambiguous whether the whole action was graceful (even though the odd crisp-eating may have been graceless), or whether each crisp-eating was done with grace. It is not a major aim of the thesis to accommodate this sort of interaction between adverbs and quantifiers; however, tentative suggestions will be made. Accompanying such examples is the question of "event summation": not a great deal will be said on this topic either, but indications will be made about the way in which it should be approached.

To return to the treatment of action within a comprehensive theory, our analysis will extend to cases of "intentional omissions". Forbearances, refrainings, or whatever, are a characteristic feature of human behaviour. Reports of such omissions are attributions of

intention and complex activity - the question arises of how many, if any, actions are performed when we refrain from doing something. In addition, there is a difference, which must be acknowledged, between refraining and simple inaction, e.g. "Brutus refrained from killing Caesar" and "Brutus did not kill Caesar". This difference will be reflected in our action theory and in logical form.

On the subject of omissions, there are a number of topics which I refrain from addressing. Although treatments are proposed for modifiers which add complexity and further information to action, certain classes of adverbs are not discussed (or not discussed at any length). These include temporal modifiers, prepositional phrases, and non-intentional subordinate clauses. In addition, all examples and treatments abstract away from considerations of tense. Perceptual reports are also beyond the scope of the thesis. Finally, the "metaphysics of action" which is presented does not distinguish explicitly between different species of "eventuality", e.g. events, states, processes etc. However, the theory that is put forward does not preclude an extension of its proposals to cover the sorts of eventuality that writers like Bach employ to accommodate certain natural language phenomena (Bach 1986b). No doubt there are other forbearances not mentioned above which help to focus the project. Although these topics are not explicitly dealt with, the thesis addresses a significant number of related issues which have been outlined above.

It has already been mentioned that, in addition to specific problem-cases, a class of expressions will be examined, and that these expressions are important because they introduce complexity or intentionality into attributions of action. In Chapter Six a Wittgensteinian characterisation of the class will be made. In anticipation, a list of the some of the principal target constructions follows:

"by" — in "X did A by doing B" (there turn out to be two senses of "by")
"in order to" — in "X did A in order to do B" (again, there are two senses)
"intentionally" — representative of intentional adverbs
"intends"
"refrains"
"rudely" — representative of a class of adverbs which has "subject oriented" and manner homonyms.

2. The Structure of the Thesis

After this introduction, the thesis can be thought of as falling into four parts. Chapter One constitutes the first part. It is concerned with presenting a theoretical perspective for the project. This is achieved partly by reacting to a number of representative interpretations of Davidson's work both positive and negative. The overall effect is to

characterise and place in context the present variant of what may broadly be called the "Davidsonian Programme".

The second part of the thesis comprises Chapter Two and Chapter Three. The objectives of this section are to investigate the sort of apparatus that a Davidsonian framework provides for the accommodation of natural language constructions, and to advocate an underlying event theory for the project. Chapter Two examines alternative theories of adverbial modification, to which the thesis is, in part, a response. In addition, having seen the requirement for a theory of events, Chapter Two supports an approach to events and actions. Chapter Three evaluates the paratactic proposal and examines Davidsonian accounts of demonstratives. The paratactic proposal is cast into doubt, while a "conditional assignment" theory of demonstratives is advocated.

Chapters Four and Five form the third part of the thesis. In each, a number of related aspects of human action and intention are explored. This investigation paves the way for the treatment of representational issues in the last two chapters. More specifically, Chapter Four contains an examination of theories of human action, and presents a further theory of adverbial modification before going on to address the question of what it means to do one thing by doing another. The "by"-relation is identified as being important in the construction of action theories and in our understanding of human action in general. A proposal is made concerning its treatment. Chapter Five examines the relationship between intending to act and acting intentionally, thereby clarifying our ideas about "intention". In addition, an account of refraining is given which illustrates and employs the account of intention.

The final part of the thesis, Chapter Six and Chapter Seven, is concerned with representation. Chapter Six makes a number of proposals about the logical forms of sentences containing the target expressions. The suggestions are made in the light of considerations resulting from earlier chapters. Chapter Seven takes a rather different line and employs insights from preceding chapters to inform an examination of work in psychology and artificial intelligence. This is mainly concerned with cognitive representations of human action or goal-directed activity. The perspective on human action which has been gained from the preceding six chapters results in proposals concerning the hierarchical representation of action.

CHAPTER 1

Davidson, Semantics, and Metaphysics

Introduction

This chapter, which lays some philosophical groundwork for the rest of the project, is divided into three main sections. The first is a very brief summary of the Davidsonian semantic programme. The second contains discussion of a number of contributors to Davidsonian theory. Throughout this analysis of the literature, which will assist us in trying to unravel the relationship between natural language, logical form and metaphysics, the emphasis is on proposals which are of relevance to the aims of the thesis. The final section indicates the perspective from which the present extension of the Davidsonian framework has been developed.

Before moving on, one or two preparatory comments might be useful. It has already been said that, since the thesis has as one of its aims a semantic characterisation of certain action sentences, the semantical aspect of Davidson's work will be important to us. It should be added that the "theory of meaning" which Davidson is interested in may be at variance with other widely held theories. To begin with, "meaning" tends to be used in many different ways. (As will become clear in the first chapter, I would rather not use the term at all.) Davidsonian semantics in its most austere form is an extensional truth-conditional semantics. It does not identify meanings with "intensions", functions, or whatever, as possible worlds semantics might. Nor does it say that meaning is really something like a relation between situations (Barwise and Perry 1983). In fact, I would rather not speculate on what meaning "really" is: a major part of the thesis is concerned with providing a description of our (use of) language in terms of relationships between sentences, and in so doing revealing the conceptual resources harboured by those sentences. Whether or not truth-conditions really are meanings, or aspects of meaning, their construction is part of the process just mentioned. I use the word "process" because, as will become apparent, I take the view that semantics is a dynamic study of language which interacts with other areas.

1. Brief Overview

There are at least two sorts of problems which face any attempt to provide an exposition and evaluation of Davidson's work. Firstly, his philosophy comprehends many

areas which are usually treated in isolation; this sort of system-building is a strength of his approach, but, as Passmore remarks, gives the impression of a "seamless web" which seems to deny access (Passmore 1985). Secondly, there appear to be a number of methods we might choose in order to find a way into his philosophy. One aim of the present chapter is to assist us in gaining entry, while at the same time allowing us to appreciate the unity of Davidson's work. The way which has been chosen to provide a brief overview of the Davidsonian project, insofar as it is a semantical one (the object of the present section), involves tracing some of the sources which have influenced its development.

Perhaps the most apparent of these influences is Tarski's work on truth theory and semantics (Tarski 1932, Tarski 1944). The relationship between a theory of truth and a theory of meaning is acknowledged throughout Davidson's work on truth and interpretation (Davidson 1984). Just what this relationship amounts to will be discussed further on. For the moment, what matters is that the sort of disquotational truth theory — which characterises truth in terms of satisfaction — for natural language envisaged by Davidson actually sweeps away a phrase like "means that" rather than making it central to the workings of the theory. Also of note is the fact that Davidson is considerably more sanguine about the possibility of constructing a truth theory appropriate to natural language than was Tarski — though in making the move from formal to natural language "some sharpness may be lost". As well as requiring that a truth definition be materially adequate — i.e. it must be in accord with "convention T" — Tarski lays down a requirement of formal correctness for such a theory. The former means that an adequate definition should have as consequences all instances of the familiar T-schema:

(T) S is true if and only if p.

The second requirement holds, among other things, that the structure of the object and metalanguages should be "formally specifiable".

By using a procedure, previously applied to domesticated, formal languages, which involves the notions of truth and satisfaction, it is hoped to characterise the semantics of natural language. Naturally, such a project will not be able to get any purchase on the raw data of natural language, so, in doing semantics, we will also be providing logical forms for English sentences. LePore points out that providing logical forms amounts to the same thing as describing the truth conditions of sentences of natural language. As will become apparent further on, during consideration of Rorty's views, the conception of meaning which is appealed to in the Davidsonian project relies on the construction of logical forms for a *number* of sentences of natural language.

The second strong influence on Davidson's philosophy comes from the work of Quine. This ingredient provides the holism which is apparent in the semantical programme, and which binds together different aspects of Davidson's work. Language is to be treated and considered as a whole, rather than in a piecemeal way. The great difference between Quine and Davidson regarding the study of logic and language is that Quine thinks that regimentation makes for better language (and better science), whereas Davidson is interested in exploration rather than reform. The sort of confidence that Davidson has in his method is illustrated by the following, from "The Method of Truth in Metaphysics" (Davidson 1977b):

> In making manifest the large features of our language, we make manifest the large features of reality... [W]hat we must attend to in language, if we want to bring into relief general features of the world, is what it is in general for a sentence of the language to be true. (Davidson 1984: 199)

In addition to Quine's holism, an influence on Davidson's programme, and on many other current semantical projects, is to be found in Frege's idea that the semantic properties of a complex expression are a function of semantic properties of its component expressions. In a similar vein to Quine, however, he regarded natural languages as too defective and recalcitrant to allow any formal description of them to be attempted.

As well as doing semantics, or providing logical forms for a variety of English sentences, Davidson addresses issues and problems in the philosophy of action and in other areas of philosophy (Davidson 1980). It would be easy to keep these concerns separate, but Davidson's philosophy tends to exploit links between doing, what may be called, "metaphysics" and doing semantics. To put it another way, the semantic programme proceeds simultaneously with, and in response to, the "metaphysical" aspect of his philosophy. The relationship between semantics and metaphysics so conceived will be discussed in following sections. The present project, for which this chapter provides a perspective, also attempts to unite themes from semantic theory and from the philosophy of action, while pursuing what may broadly be conceived of as the method of truth in metaphysics.

2. Perspectives on Davidson's Philosophy

This section is concerned with examinations of some of the various interpretations that have been made of Davidsonian theory. It is hoped that such a critical investigation will help to clarify certain issues which confront the project, help us to see what such a theory amounts to, and assist in the articulation of the present "interpretation" (and extension) of Davidson's work. Since pressures of space do not permit a full exposition of the theories to be considered, I have concentrated on aspects which are of most interest to

present concerns. Three of the interpretations represent views which can be held with respect to the relationship between language, semantics and metaphysics: LePore's and Rovane's contributions address the issue of whether metaphysics is "prior" to semantics or vice versa; Bach has presented some ideas concerning the status of semantics in relation to metaphysics. Lycan's interpretation bears on question of how the Davidsonian programme is related to linguistics. The first contribution to be discussed is due to Lycan (Lycan 1984).

2.1. Lycan's Interpretation

Lycan augments the Davidsonian approach to semantics with a number of proposals which have recently found favour in the philosophical and psychological literature. However, little is said concerning the links between the semantic and metaphysical programmes. One point which is stressed much more than in Davidson's writings is the possible connection between semantics and Chomsky's apparatus for generative grammar. This is the case even though Lycan purports to strip terms such as "transformation" of their traditional associations. Another Davidsonian theme which is emphasised is that our understanding of a sentence of natural language is partly the product of our implicit mastery of truth conditions of semantic representations (SRs) or logical forms. The other component which accounts for our understanding is our even more practical grasp of the transformations.

The idea behind the relationship between transformations and logical forms of English sentences is briefly this. We are to imagine a target sentence of English being operated upon by a battery of transformations "run in reverse". Since Lycan seems to have some reverence for the ideas of a school of thought generally known as generative semantics, the result of such an operation will be a "deep structure" which is equivalent to that sentence's logical form or semantic representation. The arguments which have been marshalled against generative semantics are too numerous to be mentioned here, so we shall just remark that fact and, for the purposes of exposition, not take issue with Lycan's theoretical standpoint; the same goes, for the nonce, for his assumption of a transformational component. The semantic representation so produced is now available for characterisation by the truth theory, the result of whose operation is a T-sentence.

Lycan tends to make strong claims about the scope and use of the truth theory within what he calls the "Metatheory". For example, it is claimed that the truth theory is responsible for predicting ambiguity present in many sentences of natural language — more than one logical form may be assigned to one sentence. Clearly, the prediction of ambiguity is not, on Lycan's Metatheory, a feature of the truth theory but of the

grammatical component: the transformations produce the logical forms which are supposed to disambiguate the sentence. The operation of the truth theory is subsequent to this.

Although the above themes are emphasised by Lycan, others are left out. For example, while the Metatheory, presented by Lycan and supposed to be some sort of continuation of the Davidsonian semantic programme, is thought to be a programme for linguistics, it is clear that the interpretation assigned to it is in conflict with certain principles thought to be of importance in Davidson's original proposals. The conviction that both generative semantics and Montague semantics are thought to be instances of the same linguistic program as Lycan's own Metatheory seems to overlook certain theses which have been thought to be useful in the construction of a Davidsonian theory. The endorsement of generative semantics indicates that the practice of formulating semantically relevant representations in terms of decompositional primitives is thought to be in accord with the formulation of "Davidsonian semantics", whereas it is clear that the distinction that Davidson draws between semantics and "analysis" (of individual predicates) threatens to exclude the project of generative semantics. It will be necessary to return to this theme in our own theoretical considerations.

The exclusion of Montague semantics from the "linguistic programme" is not as certain. The grounds upon which Davidson has dismissed such projects sometimes appear to be "superstition" — for example, an inherited Quinean fear of things intensional. At other times, the reasons given for such an aversion stem from the desire to present an "empirical" theory of language; it is this which allows (respectable) relativisation of the truth predicate to, for example, speakers and times, while at the same time criticising model-theoretic competitors which do not stick to an absolute theory of truth. Montague semantics could be described as having a narrower perspective than the Davidsonian Programme with the consequence that it can more easily be labelled as a piece of linguistic research. In the following chapters, we shall combine the broad perspective of Davidson's work with treatments of specific phenomena.

It would be useful to consider some of Lycan's other general ideas regarding the import of Davidsonian theory as he sees it. These are of interest with respect to the question of what such a theory has to say about "meaning" (why I have used scare quotes here should become clear as we proceed). A number of reasons are put forward for why we should accept that

> there is nothing worth knowing, or perhaps even knowable, about meanings that is not vouchsafed us by a correct and complete theory of truth. (pp.19-20)

The reasons are briefly as follows. (i) A theory of truth correlates "s is true" with s's disquotation, and shows how the truth conditions of complex sentences depend on the truth and satisfaction conditions of simpler expressions. Both features are thought to be valuable

for a theory of meaning. (ii) We know that the converse of the above quoted thesis is true: any adequate theory of meaning for a language should yield a truth definition for that language. (iii) Truth conditions assigned to a sentence draw upon only the concepts harboured in that sentence. (iv) A truth theory predicts semantical features of sentences, e.g. entailment, logical truth and ambiguity (the last we have already seen to be false). (v) T-sentences are empirically testable.

Although some or all of these "reasons" seem plausible, I am not as optimistic as Lycan about the connection between a theory of meaning for a language and a theory of truth for the same language. In fact, at another point in his book Lycan also professes the same sort of doubts regarding the idea of a theory of meaning (Lycan 1984, Chapter 11). The problem is that, while we may have pretty good idea of what we mean by a theory of truth (courtesy of Tarski) our ideas about meaning (in particular "the meaning of "meaning"") remain vague. Lycan admits that

> "meaning" as used preanalytically is a vague (and indexical) umbrella term that covers a surprising number of distinct and only loosely related notions; philosophic appeal to the preanalytic idea of "meaning" is therefore both fruitless and positively harmful. (p.25)

In others words we may go ahead and construct our truth theory without having to worry about objections which are of the general form "but *that* doesn't capture the meaning of such-and-such, because you've left *this* out". In fact, this is just as well, because the role which will emerge for the theory in what follows would probably not satisfy many "meaning theorists". At this point our interpretation of Davidson may be at odds with other apologists for his semantic programme. However, our characterisation of a part of natural language will not suffer because of this.

The reason for our eschewing the notion of meaning, and for why our theory takes a different line to theories which purport to provide meanings, is related to matters arising from the relationship between semantics and analysis, and how much of logic we are going to pin on logical form. To anticipate, the Davidsonian programme, as interpreted here, is concerned with the "logical behaviour" of expressions (how they perform in logical form), and not with meanings as traditionally conceived. How much logic we pin on logical form is partly determined by our policy of realising "syntactic simples" in our underlying representations rather than the results of the decompositional analysis of individual predicates. Another theme which will arise, and which helps to convey the role of the theory, is the notion of the (Davidsonian) semanticist as grammarian. The last may not coincide with Lycan's interpretation of the programme for linguistics.

As Lycan observes, we are not competely in the dark when it comes to constructing a theory of logical form: a number of principles for the choice of such a theory have been put forward by Harman (Harman 1972):

i. the theory must admit of a finite theory of truth satisfying convention T.

ii. it should minimise axioms.

iii. it should minimise novel rules of logic.

iv. it should avoid unnecessary ontological commitment.

v. it must be compatible with syntax.

Rules like these appear to have a been a rough guide which has been implicitly or explicitly followed in a number of semantic theories. Of particular interest to us are principles ii.-iv. which advise against excesses of one sort or another. It is hoped that the present project will provide motivation for the sort of austerity conveyed by these principles.

2.2. LePore's Interpretation

I turn now to remarks on Davidsonian theory made by LePore. A number of issues and themes which are of relevance to the present discussion have been presented in an introduction to the second part of a recent collection of essays on Davidson's work (LePore and McLaughlin 1985). The following is given as a general principle behind the relationship between a semantic theory and metaphysical considerations.

> Any semantic theory for a language must embody a distinctive view of the relationship between language and reality. Davidson's conviction all along has been that a semantic theory, by virtue of providing a view about this relationship, will provide substantive and illuminating answers to the various metaphysical questions about the nature of reality. (p153)

It is not clear that this "has been Davidson's conviction all along"; it is possible that the way in which Davidson writes prevents such a concrete interpretation from being made. In any case, we may regard the above as one perspective of semantic theory. It will become apparent as we proceed that the nature of the language-reality relation and the notion of "reality"/"world" which is adopted may require further elucidation.

So far we have been content to talk loosely about what we have called metaphysical issues. In fact, the greatest concern of Davidson's "metaphysical programme" has been an account of events; in studying actions we shall also be taking part in this programme. Regarding this, LePore says: "I take Davidson's strongest arguments for the existence of events to be his semantic arguments." At another point soon after, we are told that Davidson extracts an ontology from semantics (p.153). These comments suggest a way of looking at the programme which embodies a certain asymmetry. It appears that we can distinguish the semantical project from the metaphysical, but that the latter is parasitic upon the former. In other words, by doing semantics for natural language we are able to put forward metaphysical proposals — proposals about the way the world is or has to be. This, then, is one possible way of thinking of LePore's notion of the relationship between

language and reality (or our theory of it).

At another place, however, and still in connection with the idea of an event metaphysics, LePore appears to present another way of looking at this relationship:

> In particular, [a semantic theory] will require events to explain the semantic (logical) form of action, event and causal sentences. (p.153)

One way of reading this seems to suggest that the view of the programme being presented embodies an asymmetry which is the opposite of the one just mentioned. More specifically, it allows a reading like this: Do some metaphysics and use the results to plug into the semantic theory (rather than: Metaphysics is extracted from the semantics). Whether or not this is the intended reading, it may well be a plausible view to adopt. In fact, a subsequent section does contain a discussion of a perspective similar to it.

Despite the above quoted remark, I think that LePore's view is, for the most part, that metaphysics results from semantic theory (or doing semantics). There remains a problem, however, in discovering just how we are to obtain metaphysical results from semantical ones. In seems that we are to suppose that, in simply accounting for inferences and "felt implications" of English sentences (by way of their logical forms), we are able to draw "ontological conclusions" (p.154). This may be a view put forward in some of Davidson's papers (e.g. "The Method of Truth in Metaphysics"), but, as I will be suggesting later, the situation is more complicated, but, at the same time, less ambitious than this.

LePore comments on another relationship: that which holds between logical forms and truth conditions, or between the projects of providing logical forms and providing truth conditions for sentences of natural language. It is observed that on many occasions Davidson is more concerned with providing the logical forms of, for example, action sentences, rather than with their truth conditions. However, it may be said that these are one and the same project: "In laying bare the conditions under which the sentences of some infinite fragment of English are true, we as a matter of course lay bare their logical form" (p.158). In presenting his appraisal of the Davidsonian enterprise, however, LePore chooses to concentrate on the truth-conditional side of things, rather than on the construction of logical forms. The reason for this is given as follows.

> When we focus on the implications among sentences rather than on their truth conditions, we are more inclined to devise rules for assigning syntactic forms to these sentences and to devise rules for licensing these inferences on the basis of these forms. This way of proceeding obscures ontological commitments, because it encourages us not to think semantically. When we couch the debate in terms of finding the semantically relevant structure which will "oil the wheels of the semantic theory", there is no danger of myopia. But this is not so much a change in project as a difference in emphasis. (p.158)

The present interpretation of Davidson is also concerned with the emphasis of certain features of the "programme".

2.3. Rovane's Interpretation

In a recent paper, Rovane has put forward some ideas about the connection between theories of meaning and metaphysics (Rovane 1986). An examination of these proposals will permit us to reconsider themes already touched upon and to introduce new ones. The approach taken by Rovane is in accord with comments made earlier in connection with a reading of part of LePore's characterisation of the semantic project, and it contrasts with Davidson's "Method of Truth in Metaphysics" and, as will become apparent in the following section, with Emmon Bach's thoughts on "natural language metaphysics".

Rovane chooses to couch her discussion in terms of "categories", where that term is used in a loosely Kantian manner:

> the term "category" vaguely suggests a rule of thought, but more typically, it refers to any one of a bundle of interrelated concepts that together yield some general notion of "objectivity". (p.417)

The concerns are with what Davidson calls "the broad features of reality", which he hopes may be discovered through his method of truth. This method requires us to isolate the common features of truth conditional theories of meaning that follow from the general constraints on them, and to examine the features for metaphysical significance. It is the "principle of charity" which provides the rationale for the method of truth — the principle ensures that "successful communication proves the existence of a shared, and largely true, view of the world". It is one of Rovane's intentions to bring into question the method of truth in metaphysics. What we sometimes refer to as "metaphysical", she refers to as "categorial". She holds in common with Davidson the view that a study on the conditions on interpretation or communication can yield categorial insights. For Davidson, it is claimed, the conditions on interpretation amount to the general constraints, formal and empirical, on any theory of meaning (theory of truth). What Rovane does question is whether we are able to move *from* the account of general constraints on meaning-theory *to* metaphysical conclusions. In contrast to Davidson, who locates the metaphysical significance of his interpretive perspective in the structural details of meaning-theory itself, Rovane suggests that we examine the conditions which make meaning-theory possible and which may not even be reflected in its structure. In other words, certain "categories" must already be in the picture *prior* to the construction of a theory of meaning/truth. It is thought that the categories are in some sense prior because they may figure in certain (necessary) presuppositions of the speaker-interpreter situation; hence Rovane's interpretation is a Kantian one.

Rovane emphasises the similarities between Davidson and Kant, but seems to think that Davidson's Kantian approach improves on Kant's own in that it is not situated in an "empiricist problematic". By doing away with the idea of a conceptual scheme in "On the Very Idea of a Conceptual Scheme" (Davidson 1974), Davidson undermines the scheme-

content (concept-intuition, organiser-organised) distinction which is present in Kantian metaphysics. (We shall return to this feature of Davidson's philosophy in the final section of the chapter.) However, the overall strategy of getting metaphysical conclusions by looking at the presuppositions of belief is retained. The difference is that Davidson ties belief, not to the concept of experience as Kant does, but to the concept of communication. To come back to Rovane's criticism, the constraints that are important to metaphysics should move from the *concept* of communication, not from the theory of meaning that purports to describe our communicative practice. To be more specific, the problem lies with the principle of charity (it is not at issue that charity is effective against relativism and the possibility of global error). What charity tells us is that we are all in agreement, and that what we are agreed about is true, but it does not tell us *what it is* that we are in agreement about. In other words, by itself, charity does not require agreement about anything in particular. All of which means, in Rovane's terms, that Davidson has not given us reason to suppose that certain categories of things exist.

I think that there is an element of truth in what Rovane says in criticism and appraisal of the Davidsonian method. However, for the most part I am inclined to disagree with the more positive parts of her interpretation. It will become clear in what follows that the present project is not in accord with the thesis that semantics is the be all and end all of metaphysics. Rovane seems to go along with this in her Kantian translation of Davidson's themes. The emphasis on this sort of translation also serves to bring out another theme which will reappear in due course. The introduction of a Kantian notion of "objectivity" points to an empirical realism which may be contrasted with the metaphysical realism which is sometimes attributed to Davidson in order to gain critical purchase on his theory. Later in this chapter, we shall find sympathy with another position which will also cast doubt on the standard realist interpretation of Davidson's work.

There is a difference in the approach that Rovane takes to the Davidsonian project and the approach that I would like to take, or the light in which the present project can be seen. Whereas Rovane's advice concerning the Kantian perspective to be taken might seem to have little direct application to what Cresswell calls the "working semanticist", I would like the interpretation of the present enterprise to be of relevance to the actual business of semantics (and, as it turns out, to the construction of metaphysics). Instead of emphasising the importance of doing semantics, Rovane's ideas seem more applicable if we are engaged in thought experiment. In view of this, it would be useful to translate her proposal into terms which are of more relevance to the way in which I look at a project like Davidson's. Very briefly, Rovane's idea is, I think, to pursue metaphysics, or to establish by some sort of transcendental argument the authenticity of the "categories", and then to use the results to inform the semantic enterprise. In other words, we first sort out what has to be

"presupposed" in order to get the semantics off the ground and then, in the security of this knowledge, let the semantic theory fall out as it may. This may be an oversimplification of the method advocated by Rovane, but the intention is to throw it into contrast with the present conception of the Davidsonian method of truth in metaphysics.

I would like to urge that Davidson's method be seen as *a* method in metaphysics. LePore points out that he thinks that Davidson's strongest arguments for the existence of events are his semantical ones. This suggests, quite rightly, that there are other non-semantical arguments for the same "category". What I would like to suggest, and support in due course, is that it is not possible to identify a dependence or a priority between these two sorts of arguments.

One specific criticism of Rovane's proposal, as I have presented it, is that not enough importance is attached to the phenomena of linguistic data in discussing semantic theory. It is very unlikely that the complexities exhibited in the linguistic data may be accommodated by means of somehow drawing out the presuppositions of what the theory of meaning is of, i.e. communication. At least, the semantics should be seen as some sort of evaluation of the categorial results of such a transcendental method. If we suppose that this is the case, and that, in fact the categories involved turn out in some sense to be unsatisfactory, then presumably it will be necessary to come up with another set of "presuppositions" [1]. Putting it this way does not seem to allow for semantics to be the dynamic process that, in view of our attending to the linguistic data, it needs to be.

A further aspect of Rovane's interpretation which seems to provide one motivation of the Kantian perspective proposed is the burden of explanation put on the principle of charity: "the principle of charity yields little for the metaphysical issues at hand" (p.426). As we have recorded, this is supposed to be because, although this principle tells us that we are all in agreement, it does not tell us what we are in agreement about. In challenging this, I would say that it is not from the principle of charity (alone) that metaphysical results are meant to be obtained. It is actually from the (sometimes tedious) business of working out such things as how we are to obtain satisfactory representations in our canonical idiom for a family of expressions of natural language; in particular, those which seem to exhibit interesting or recalcitrant phenomena. Once again, the emphasis should be on semantics as an activity rather than simply an ingredient of philosophical speculation.

---

[1] A "set" of presuppositions is involved because, according to Rovane, the categories are related to one another: "And so the distinctive and perhaps unique metaphysical, or antisceptical, contribution of Davidson's perspective may be precisely the discovery of these interrelated categorial commitments" (p.428).

2.4. Bach and Natural Language Metaphysics

In this subsection I would like to describe and comment upon some ideas put forward by Emmon Bach, both when discussing time, tense, and aspect in language (Bach 1981) and when discussing broader issues in natural language semantics (Bach 1986a). Such an evaluation will provide an opportunity to make comparisons with some of Davidson's work and introduce further themes.

In his consideration of temporal phenomena, subtitled "An essay in English metaphysics", Bach says about his project:

> This essay may be thought of as an exercise in "ethnometaphysics", an attempt to dig out the hidden assumptions made by speakers of English about the way the world is. (Bach 1981:34)

Further on, we are told that a number of puzzles about the English tense-aspect system and its interaction with temporal expressions may be solved by positing certain metaphysical assumptions made by speakers of the language. All this seems to suggest that Bach is a little cautious in his metaphysical speculation: what we are attempting to discover in this sort of exercise is "merely" what it is that speakers or semanticists must say exists. Bach makes the point more explicitly in a later essay (Bach 1986a). Here Bach takes metaphysics to be the study of "how things are" which addresses questions like

> What is there?
>
> What kinds of things are there and how are they related?

He goes on:

> Weighty questions, indeed, but no concern of mine as a linguist trying to understand natural language. Nevertheless, anyone who deals with the semantics of natural language is driven to ask questions that mimic those just given:
>
> > What do people talk as if there is?
> >
> > What kinds of things and relations among them does one need in order to exhibit the structure of meanings that natural languages seem to have? (p.573)

There is a temptation to read Bach as saying that there are (at least) two sorts of enterprise, real metaphysics, "the real thing", and natural language metaphysics. The second sort is associated with the questions that mimic the real thing. It is clear that saying this is not the same as saying that in doing natural language semantics we must also do metaphysics (the real thing). So, what we have in the present case are two species of metaphysics; what is noticeable is that Bach does not attempt to indicate how they are related.

It is possible to characterise natural language metaphysics in other ways. One of the theses which Bach wants to establish is summarised by the slogan:

"No semantics without metaphysics"

Bach describes semantics in a way which is similar to his cautious treatment of "metaphysics": "I understand semantics in the sense of a theory of the relationship between language and something that is not language" (p574). In pursuing natural language metaphysics, Bach believes that he is going beyond pure semantics as usually conceived

As well as the above slogan, Bach wants to adhere to another which concerns the relationship between "lexical" and "structural" semantics. Many writers contend that it is possible and desirable to draw a sharp line between the projects of structural (or constructional, or truth conditional) semantics and lexical semantics. For example Thomason says this (Thomason 1974):

> But we should not expect a semantic theory to furnish an account of how any two expressions belonging to the same syntactic category differ in meaning. (p.48)

What is meant by this sort of claim, Bach thinks, is that in constructing semantics for a natural language we start off with items like "fish" or "walk" or "kiss" knowing simply what *kind* of meanings they have. For example, in a Montague-type framework "fish" denotes a property or a set if individuals, "kiss" a two-place relation between individuals, etc. The subject-predicate rule which gets us sentences like "John walks" should, according to advocates of structural semantics, in no way depend on differences among the individual meanings of lexical items like "walk", "kiss", etc. Now, contrary to this, Bach wants to urge that, on occasion, we have to look at the meanings of individual items to do our structural (truth-conditional) semantics. The second slogan is therefore:

"No constructional semantics without lexical semantics"

In connection with the two slogans adopted, Bach says:

> There are at least two parts of the enterprise of doing the semantics of natural languages where metaphysical questions rear their (ugly or beautiful) heads: in making decisions about the general structure and content of our models... and at points where it seems that we have to go "inside" the meanings of particular lexical items in order to state compositional rules of the semantics. (p.576)

I would like to bring Bach's two slogans, the motivation behind them, and the view of metaphysics underlying them, into question. I shall start off with "No semantics without metaphysics". This dictum could be used to support a number of semantic projects, including the present one. However, behind Bach's use lies a certain bifurcation of metaphysics. By our lights, the distinction mentioned is unnecessary. This is evident if we contrast Bach's perspective with the perspective put forward by Davidson in, for example, "The Method of Truth in Metaphysics" (Davidson 1977b). As we have already indicated, the method of truth in metaphysics can be considered as a way of doing metaphysics dictated by semantical considerations of language: in adjusting to interesting phenomena encountered in natural language, a theory of truth may have metaphysical repercussions.

What is meant by "metaphysics" here is what is meant by the sort of metaphysics which we earlier referred to as "the real thing". We would not want to say that there are two species of study, but instead that in doing "natural language metaphysics" we are doing the real thing.

We may now ask whether Bach's distinction is of any use to us. What I think Bach may have been thinking of when he proposed to distinguish between metaphysics proper and natural language metaphysics, and what a Davidsonian theorist may well go along with, is a difference in *method* rather than in area of study. As has been mentioned before, the method of truth is *a* method in metaphysics not *the* method; non-linguistic methods are normally associated with this sort of enterprise. As Davidson says (Davidson 1984):

> It should be clear that "the method of truth" in metaphysics does not eliminate recourse to more standard, often essentially non-linguistic, argument or decisions. (pp.213-214)

In fact, the relationship between the different sorts of methods will occupy parts of the following sections.

The second slogan bears on a another Davidsonian theme, which it will also be necessary to press into service in the course of the present project: the difference between questions of analysis and questions of logical form. In the present context, the former might be thought of as the domain of lexical semantics, while the latter could be considered under the heading of structural semantics. Davidson comments upon the distinction in "Truth and Meaning" (Davidson 1984):

> I think it is hard to exaggerate the advantages to philosophy of language of bearing in mind this distinction between questions of logical form or grammar, and the analysis of individual concepts... [S]entences like "Bardot is good " raise no special problems for a truth definition. The deep differences between descriptive and evaluative (emotive, expressive, etc.) terms do not show here... What is special to evaluative words is simply not touched. (p.31)

There may be problems if the distinction is not observed:

> It is consistent with the attitude taken here to deem it usually a strategic error to undertake philosophical analysis of words or expressions which is not preceded by or at least accompanied by the attempt to get the logical grammar straight. For how can we have any confidence in our analyses of words like "right", "ought", "can" and "obliged" or the phrases we use to talk of actions, event, and causes when we do not know what (logical, semantical) parts of speech we have to deal with? (p.32)

The sorts of example in which Bach feels justified in "going inside" the meanings of particular lexical items and doing lexical semantics are illustrated by the following (Bach 1986a: 585):

(1) Mary is building a cabin. Therefore, Mary has not built a cabin.

(2) Mary is running. Therefore, Mary has run.

These contrasting examples of the progressive suggest to Bach that we must separate processes from events. It also suggests to him that we must attend to the meanings of individual lexical items, and that the truth conditions for the expressions involved may very well depend on the meanings of the individual verbs.

What I think Bach has done in these cases is similar to what Davidson might refer to as giving the semantical parts of speech of the linguistic items involved. This sort of project is not concerned with the decomposition of such items into alleged semantic primitives. It is this which makes me disinclined to to call it lexical semantics. As Bach seems to acknowledge, the result of this analysis amounts to saying what there is "in the world". That having been said, we may now ask whether what has been done has been achieved by "looking into" the meanings of the words or predicates. It is clear, I think, that in doing semantics we will always have to acknowledge the meanings of individual lexical items; we cannot help but do so. And if it assists in the project of uncovering the logical forms of sentences containing recalcitrant constructions, then so much the better. What must be avoided is the temptation to think of "analysis" (qua looking into meanings) as a method whose results are to employed into the representation at the level of logical form. In other words, it is not part of the project to treat decompositional primitives as candidates for components of logical forms; logical forms are constructed using unanalysed syntactic simples (there could be a separation of inferences at the level of lexical meaning and inferences at the level of logical form). This, together with the acknowledgement that looking at meanings (or analysis) may assist or go hand in hand with the semantical project, is in accord with the advice given by Davidson and quoted above. The current extension of Davidson's work will include an instance (the case of refraining from action) in which the semantical enterprise interacts with the "philosophical" one. What this sort of interaction amounts to should become clearer in the next section.

3. Present Concerns

In this section I would like to give some idea of where the present project stands with respect to the interpretation, or use made, of Davidson's theory. The way of characterising the study that I have chosen involves an examination of the work of other contributors, principal among whom is Richard Rorty. I draw upon several themes which are presented in his book, "Philosophy and the Mirror of Nature" (Rorty 1980).

There Rorty makes a distinction within contemporary philosophy of language which portrays Davidson's work in that field in an illuminating way. The terms which are used to separate the two sides of the subject are "pure" and "impure" philosophy of language. Pure

philosophy of language has its roots in the work of Frege, Wittgenstein and Carnap (Carnap 1947). This study discussed

> problems about how to systematize our notions of meaning and reference in such a way as to take advantage of quantificational logic, preserve our intuitions about modality, and generally produce a clear and intuitively satisfying picture of the way in which notions like "truth", "meaning", "necessity", and "name" fit together. (p257)

One feature of pure philosophy of language is that it has no "epistemological parti pris". In pursuing "a purified conception of the philosophy of language", Davidson makes a distinction between philosophical projects which form part of the theory of meaning properly so-called, and those motivated, according to Rorty, by "some adventitious philosophical puritanism": Frege and Tarski are thought to have pursued the first sort of project, whereas Russell and Quine "mingled pure theory of meaning with impure epistemological considerations" (p.259). The source of impure philosophy of language is different, then, because philosophical points about the nature and extent of human knowledge are stated as remarks about language; the methodology involves the "logical analysis of language". These two sources are now reflected in the work of writers like Davidson (pure) and Dummett and Putnam (impure). The contrast between the two species, as suggested by Rorty, provides an illuminating interpretation of Davidsonian theory, which will be of interest in pursuing our own modification and extension of Davidson's work. In a sense, since we are characterising language along Davidsonian lines, we are following Rorty's guide for pure philosophy of language; however, it is not at all clear that everything that is involved in what is to follow will fall easily into Rorty's plan or his interpretation of Davidson. In fact, it is not the intention so to do (this does not make the discussion of Rorty any less relevant).

The theory of meaning (qua theory of truth) is described by Rorty in opposition to "traditional" theories of meaning:

> A theory of meaning, for Davidson, is not an assemblage of "analyses" of the meanings of individual terms, but rather an understanding of the inferential relations between sentences. To understand these relations is to understand the truth-conditions for the sentences of English, but for lots of simple sentences ("An oak is a tree", "Russia is our fatherland", "Death is inevitable") there are no more enlightening truth-conditions to be given than for "Snow is white". (p.260)

We have already seen the need to discuss the question of the analysis of individual words and predicates and the above is in accord with our earlier comments. Although many sentences are uninteresting, or have uninteresting truth conditions, there are a number of sentences which show considerable reluctance to be accommodated within the truth conditional framework. I tend to think of such sentences as falling into "families" which exhibit similar problems — "problem families". In the chapters which follow this, one aim will be to settle such a family in a Davidsonian environment. When sentences like these are encountered, and successfully dealt with, we obtain truth conditions which are not

trivial, are hard to construct and are "testable only by their susceptibility to integration within a theory of truth-conditions for other sentences" (p.260). This last remark respects Davidson's holistic approach to language.

Rorty thinks that the results of the Davidsonian programme would do little to help or hinder any solution of any of the text-book problems of philosophy. This is probably the case, and has in part been brought about by Davidson's introduction of the idea (or possibility) of a "philosopher-linguist". My use of this term should not be taken to indicate a return to what is variously known as "linguistic philosophy" or "Oxford philosophy". One way of differentiating the two projects, and showing that Davidsonian philosophy may actually be the converse of linguistic philosophy, is to consider the following catch-phrases, or caricatures, with which they might be associated. Linguistic philosophy we could say is "philosophy by linguistics", whereas at least part of Davidson's programme might be described as "linguistics by philosophy". That this is just part of the programme will become clear in due course. The idea is that by doing a certain amount of philosophy ("metaphysics", or whatever), which interacts with the semantical project, we arrive at an account of how language works. This, of course, is quite different from using linguistic explanations to "solve" philosophical puzzles. One problem which has surfaced in earlier sections has been that of determining the way in which metaphysics, semantics and linguistics are related. Rorty provides another description of Davidsonian theory, this time in connection with the idea that the theory of meaning will have to be an empirical theory:

> Thus there can be no special province for such a theory save, roughly, the province of the *grammarian — the attempt to find ways of describing sentences which help to explain how those sentences are used.*" (p.261) (my emphasis)

The idea of Davidson as a grammarian separates his work from Quine's, and bears on realist interpretations of Davidson. From a perspective which does not assign Davidson to the realist camp, canonical notation is not an attempt to "limn the true and ultimate structure of reality" (Quine 1960); it is more properly seen as a way of describing the part of reality which is the use of language. The notion that Davidson is interested in the use of language may be associated with the connection that Rorty sees between Davidson and Wittgenstein:

> I shall be contrasting the [impure programme] with a "pure" or "pragmatist" or "language-game" approach to language, which I think is illustrated by Sellars and by Wittgenstein as well as by Davidson (despite the differences which may seem to set these three in opposition to one another). (p.265)

In another place, Rorty invokes the idea of a language-game to articulate the "modest" notion of truth which is employed by Davidson (Rorty 1986). In contrast to advocates of "traditional" theories of truth, Davidson asks how "true" is used by the outside observer of the language-game: "the field linguist must be properly coherentist in his approach going round and round the hermeneutic circle till he begins to feel at home" (p.339). If Davidson

is to be seen as a "correspondence theorist" then we must interpret this epithet fairly liberally so as to take account of Rorty's observation as well as Davidson's own animadversions on the subject (Davidson 1969b).

As remarked earlier, Davidson's programme is not interpreted as a traditionally epistemological one. Dummett, on the other hand, sees philosophy of language as foundational, because he sees epistemological issues now being formulated as issues in the theory of meaning ("philosophy has, as its first if not its only task, the analysis of meanings"). Not only does Davidson take a different line, but, Rorty claims, issues like "how language hooks onto the world" which fuel a realist-idealist debate do not arise. Since the language-fact and scheme-content distinctions have been abandoned due to criticisms by Quine and Davidson "we no longer have room to state this issue between realist and idealist".

In connection with the ideas of the preceding two paragraphs, we may take up Rorty's notion that (for Davidson) discussions of the way in which truth is correspondence to reality float free of discussions of what there is in heaven and earth: "Correspondence, for Davidson, is a relation which has no ontological preference - it can tie any sort of word to any sort of thing" (Rorty 1980: 300). (Considerations put forward in due course will complicate this picture slightly.) Once again, in providing the truth conditions for English sentences, we will not be constructing a canonical idiom in an attempt to descry the true and ultimate structure of reality. I think that such observations are consonant with those made by LePore (discussed earlier) which see the Davidsonian project as helping to reveal the conceptual resources harboured in sentences of natural language. At the same time, as Davidson remarks, in "On the Very Idea of a Conceptual Scheme" (Davidson 1974):

> In giving up dependence on the concept of an uninterpreted reality, something outside all schemes and science, we do not give up the notion of objective truth... In giving up the dualism of scheme and world, we do not give up the world, but reestablish unmediated touch with the familiar objects whose antics make our sentences true or false. (p.198)

Rorty's work is strongly redolent of the pragmatism of Peirce, James, and especially Dewey. Such a pragmatist may provide an "account" of truth in terms of "what we will believe if we keep enquiring by our present lights", or "what it is better for us to believe" or "warranted assertibility". However, rather than constructing a theory of truth, Rorty sees Davidson (and Tarski) as embracing the pragmatists' dissolution of the traditional problematic about truth (Rorty 1986). It is a "homely and shopworn sense of "true"" rather than a special philosophical sense of that term which Rorty believes that Davidson is attending to. In connection with this, he says (Rorty 1980):

> Davidson's is the "pure" project of finding a way of diagramming the relations among the sentences of English so as to make perspicuous why people call some longer sentences "true" by seeing this as a function of their calling shorter sentences "true". (p.308)

We may go along with Rorty's pragmatism, but it is at another level, or in another sense,

that I would like to invoke ideas of pragmatism [2]. The pragmatism that I am referring to characterises the semantical project and its relation to metaphysics — the interaction has been the subject of preceding sections. It may be invoked in connection with the notion of "metaphysics adequate to the semantical enterprise". There is, in a sense, a pragmatic constraint derived from our semantic theory on our metaphysics. This pragmatism may well be said to have its roots in the semantic theory itself along the lines that Rorty suggests. Like Davidson and Rorty, we are not so much concerned with "what there is in heaven and earth" (in the usual realist sense).

It should be pointed out, however, regarding the comments made in a previous section, that, although our present concerns incline towards the semantic, there is not a great asymmetry residing in the relationship between semantics and metaphysics. In order to illustrate this, I would like to draw upon a philosophical idea, also used by Rorty in different circumstances in "Pragmatism, Davidson and Truth" (Rorty 1986). There the field linguist is described as "going round the hermeneutic circle" long enough to come up with T-sentences which maximise the truth of the native's beliefs. Going round the hermeneutic circle means not attempting to start with secure links, but rather going back and forth between guesses at translations of occasion sentences and standing sentences until something like a Rawlsian "reflective equilibrium" emerges. It is the idea of a reflective equilibrium that is useful in characterising the interaction between semantics and metaphysics. One description of this notion comes from Nagel in a discussion of the interplay between underlying principles and particular moral judgements (Nagel 1973, Rawls 1972):

> When this interplay between general and particular has produced a relatively stable state, and no immediate improvements on either level suggest themselves, then our judgements are said to be in a state of *reflective equilibrium. (p.221)*

Something like this seems to be in evidence in Davidson's own writings on semantics and on the theory of events, and it may well be present in this project. What it comes to is that a stable state may be reached in the interplay between semantic theory and metaphysics resulting in an informed semantics and a "constrained" metaphysics. So in this sense the Davidsonian project is not simply linguistics by philosophy, since it also aims at interesting metaphysics by doing semantics. There is no great asymmetry between the philosophical and semantical sides of the enterprise; they proceed in tandem and influence each other as they progress. The (related) "results" which are obtained hopefully include a description of natural language and an interesting, "pragmatic", metaphysics (adequate to the semantical

---

[2] At no point during this discussion am I using terms such as "pragmatics" and "pragmatism" in a Gricean sense.

enterprise). Moreover, it is hoped that, by virtue of its evolution, the metaphysics represents a well-articulated set of ideas. Before concluding, I turn to a different topic.

There have recently been some attempts to incorporate ideas or terms, which have been generated by philosophical debate, into work which is carried out in other disciplines. An example of this is to be found in psychological proposals due to Susan Carey (Carey 1982). Here, the causal theory of reference, as developed by Kripke and Putnam, is thought to be germane to psychological theories of semantic development (Kripke 1972, Putnam 1973, Putnam 1975). The Putnam-Kripke theory applies to certain terms: proper names and natural kind terms. Carey is interested in the latter. Putnam has claimed that successful reference for natural kind terms is ensured by a causal chain and an initial baptism. Furthermore, he intends his theory to be an attack on standard doctrines of meanings which hold that meanings or intensions determine extensions and that meanings are "in the head". Carey thinks that the causal theory raises interesting questions for an account of semantic development which claims to accommodate natural kind terms (Carey 1982):

> According to the causal view, the lexical entry for a natural kind term contains the information that it is a natural kind term, and also contains some representation of a typical exemplar. The question of semantic development arising from the Putnam-Kripke view, then, is whether natural kind terms in the adult lexicon..., if they are in the child's lexicon at all, are also natural kind terms for the child. (p.383)

Carey's endorsement of Putnam's position is set against her equation of meanings and concepts. In view of this, and Putnam's views on the subject, we may experience a certain amount of unease in accepting Carey's use of the theory. Additionally, it seems to be characterised by taking the line that philosophical theories deliver results which tell us something about "the world" (and how language hooks onto it). Rather than assume this, our own interdisciplinary discussion in Chapter Seven will propose a shift in perspective as a result of a comparative study.

Rorty is suspicious of theories of reference in which reference is supposed to be a factual relation which holds between an expression and some other part of reality whether anybody knows it holds or not. As Rorty points out, this is not the same relation as "talking about", which can range over fictions as well as realities (Rorty 1980:289). However, reference is often confused with this other relation, with the result that it is thought that we can have intuitions about reference, intuitions which might be the basis for a nonintentional and "theory-independent" theory of reference. The quest for a theory of reference is hopeless, since it seems to demand some transcendental standpoint outside our present set of representations from which we can inspect the relations between those representations and their object (Rorty 1980:293). These comments augment Davidson's own reservations about theories of reference (Davidson 1977a).

The present approach is representative of a different perspective from the one outlined above, which is compatible with some of Rorty's proposals regarding the nature of pure philosophy of language. In Davidsonian semantics, he claims, discussions of the way in which truth is correspondence to reality float free of what there really is "out there". In addition, he says that, for Davidson, correspondence has no ontological preference and can tie any sort of word to any sort of thing. Our earlier observations should make us modify this slightly: although Rorty's idea may be correct in principle, in practice there is the constraining influence of the interplay and resulting reflective equilibrium between semantics and metaphysics which was described earlier. The present project does not embody some of the problematic principles described in the preceding discussion. It may well be possible that the well-articulated ideas which result from it can be employed in psychological theories. In fact, the final part of the project will be an attempt to use earlier results to inform an examination of work in other disciplines.

Conclusion

In this chapter the practice of the semanticist and the nature of the Davidsonian Programme has been characterised along lines which suggest cooperation and interaction between semantics and metaphysics. The nature of the preceding discussion has placed the present modification and extension of the Davidsonian framework against the background of criticism of and support for that approach. There will be evidence of a coevolution of semantics and metaphysics in subsequent chapters which concern themselves with the semantics of action sentences and theories of actions and events. The resulting approach to human action will allow for an articulate study when we turn to an interdisciplinary perspective in the final chapter.

Having now laid some philosophical groundwork, Chapters Two and Three address issues arising from the choice of apparatus needed to represent reports of human action. Chapter Two discusses theories of adverbial modification, and illustrates specific problems which have been thought to infect the Davidsonian approach, which we wish to retain. In considering adverbial modification the question of the role and nature of events becomes important. The second half of the next chapter examines the "metaphysics" of events, and having considered different positions, makes a recommendation.

CHAPTER 2

Adverbial Modification and Event Theory

Introduction

The chapter is divided into two main sections dealing with the treatment of adverbs and the theory of events. In the course of evaluating theories of adverbial modification, and assessing the competition to Davidson's approach, it will become clear that such an account of adverbs demands a complementary theory of events. The discussion of different approaches to the accommodation of adverbs will illustrate the sort of difficulties which a Davidsonian theory should be expected to overcome. The aim of the second part of the chapter is to establish the event theory which we shall employ in subsequent chapters. Once again, the merits of differing accounts will be assessed before a particular approach is endorsed.

1. Adverbial Modification

This first main section contains an introduction to and discussion of some theories of adverbial modification with criticism where appropriate. One of the ideas is to illustrate the sort of problems which have been thought to loom large for a broadly Davidsonian account of adverbs, i.e. the sort of account which we endorse. A principal aim of the present work is to investigate the possibilities of overcoming some of these difficulties within such a framework. Before we move on to theoretical considerations, it would be worth prefacing the following sections with a brief classification of some of the adverbial constructions in which we are interested.

Jackendoff has described the classes into which adverbs generally fall (Jackendoff 1972). Apart from manner adverbs, two other principal categories are: speaker oriented adverbs and subject oriented adverbs. We shall not have much to say about adverbs like "necessarily" and "possibly", which seem to fall outside these categories, but, since examples from the above two classes will crop up in the course of our treatment of reports of "complex" action, it would be as well to say what is connoted by their labels. Subject oriented adverbs receive a characteristic paraphrase:

Clumsily, John dropped his cup.

is read as

It was clumsy of John to drop his cup.

which is not to say something about the *manner* of John's action. The same adverb at the end of the sentence would express this. Other subject oriented adverbs are "intentionally", "deliberately" and "rudely" (in one sense). Speaker oriented adverbs, which relate to the speaker's attitude, will be of less importance to us, but include "frankly", "truthfully" and "happily" (in one sense). Once again, these do not say something about the manner of an action. Manner adverbs bring with them problems of their own such as "attributivity". In other words, they seem to involve a comparison class or some other sort of relativity. They will not be dealt with here at great length, but will arise again in Chapter Six.

1.1. Adverbs as predicates

Davidson's proposals regarding the representation of adverbs are most concisely presented in one well-known paper, "The logical form of action sentences" (Davidson 1980). There are other places in which suggestions are made concerning aspects of the behaviour of adverbs, but, for now, we shall take this paper to be the one upon which to concentrate. The canonical idiom within which such expressions must be accommodated is plain old first-order predicate logic, a form of representation to which, along with Quine, Davidson naturally gravitates. The parallels and differences between the work of Davidson and Quine have already been made clear.

The analysis which Davidson gives is related to one which appears in work by Reichenbach on the same topic (Reichenbach 1947). The last-mentioned provides two accounts of the behaviour of adverbs, one of which involves expressing adverbial phrases within a higher-order predicate calculus. Given the inclination of Davidson noted above, it is unsurprising that he finds Reichenbach's alternative analysis to be of interest to his project. The sort of thing that Reichenbach has in mind is illustrated by Davidson in the following example. We might render a sentence like

(1) Amundsen flew to the North Pole.

as

(2) $(\exists x)$(x consists in the fact that Amundsen flew to the North Pole)

Now the expression "is an event that consists in the fact that" is to be viewed as an operator which, when prefixed to a sentence, forms a predicate of events. Were we to use the same method on a sentence like

(3) Amundsen flew to the North Pole in May 1926.

we would obtain something like

(4) (∃x)(x consists in the fact that Amundsen flew to the North pole in May 1926)

However, since (4) does not entail (1) as it should, Davidson suggests that we render (3) as

(5) (∃x)(x consists in the fact that Amundsen flew to the North Pole & x took place in May 1926)

The whole business about "facts" and their involvement in the representation of action sentences is troublesome. It creates an intensional context, and, in view of Vendler's comments regarding the elusiveness of facts compared with events (Vendler 1967), we, like Davidson, who offers an argument variously referred to as the "slingshot" or "Great Fact" argument, should be persuaded to adopt a more streamlined analysis. The idea is that to begin with we construe verbs of action as three- rather than two-place predicates, so that "Brutus killed Caesar" goes over as

(6) (∃x)Kill(Brutus,Caesar,x)

where the extra argument place is reserved for an event variable. We can illustrate the effect that this has on displaying the structure of a sentence, and the way in which it now suggested that we represent adverbs, by using Davidson's original example:

(7) (∃x)(Flew(I,my spaceship,x) & To(the morning star,x))

This enables us to conclude, among other things, that I flew my spaceship — the sort of inference which was blocked on a Reichenbachian analysis. One of the principal merits of Davidson's proposal is the ease with which it licenses "adverb-dropping" inferences.

The main problem which paraphrases of the form of (7) were intended to overcome is due to Kenny (Kenny 1963) and has been labelled "the variable polyadicity problem". If

we take another well-known example sentence like

(8) Jones buttered the toast in the bathroom with a knife at midnight.

we may be tempted to analyse the verb as a five-place predicate. However a simpler sentence like "Jones buttered the toast" would go over as two-place predicate, which would not be entailed directly by (8). Furthermore, any sentence more complex than (8) would require more argument places — the more adverbs the greater the polyadicity of the verb. Davidson's conjunctive analysis presented above avoids this and allows the verb to have a constant number of argument places.

Davidson presents an analysis for action sentences which contain adverbial modification, but is careful to say which species of adverbial modification are covered by his proposals. (8) is a shortened version of an earlier example sentence which was thought to contain elements which were too unruly for accommodation within his framework:

(9) Jones buttered the toast slowly, deliberately, in the bathroom, with a knife, at midnight.

The first two adverbs, "slowly" and "deliberately", are excluded from the enquiry. This is because the former is an attributive — representative of a problem class — while the second is an intentional (and an intensional) adverb. An aim of the present project is to suggest how certain intentional expressions could be accommodated within a Davidsonian framework. A hint will also be made for the treatment of attributives employing the same general principle. It will be suggested that there is general way of representing most, if not all, sorts of adverbs.

Regarding the English paraphrase of sentences containing action verbs rendered along Davidsonian lines, we have, as Wiggins points out, a number of options (Wiggins 1985). Taking Wiggins' own example of Kallias walking, we may say something like the following: "there is an event that consists of Kallias walking" or "Kallias is walking a walk(ing)" or "Kallias is walking something". I do not see that there need be much discussion, as Wiggins does, about which one to adopt. I find that the first is the most natural reading. The following subsection outlines the major competitors to Davidson's account

1.2. Predicate modifier theories

Davidson's theory allows us to paraphrase a sentence like "Brutus killed Caesar violently" as something like "There is an event which is a killing of Caesar by Brutus and it is violent". An alternative position has been taken with respect to the proper way to represent adverbs ("proper" because it can, it is claimed, accommodate certain characteristic behaviour of adverbs which is out of the reach of the Davidsonian analysis). This position regards adverbs, not as predicates, but as predicate modifiers. Since the contributions to the predicate modifier theory contain a number of reasons why an event predicate analysis may not be suitable, it would be as well to explain what such criticisms amount to in order that what is presented in following chapters can take account of this. The contributions considered are due to Montague, Parsons, Clark and Thomason and Stalnaker (Clark 1970, Dowty, Wall and Peters 1981, Parsons 1970, Thomason and Stalnaker 1973).

A common element among these theories of adverbial modification is the belief that the project of accommodating recalcitrant adverbial expressions should proceed by extending or augmenting the vocabulary of "standard" first-order predicate logic in suitable ways. One reason for adopting this sort of approach is that it is thought desirable to achieve a match or similarity between logical forms, underlying representations, or whatever, and the "surface grammatical form" of sentences of natural language. The move that is made in the case of adverbs is to construe them as modifiers, which at the simplest means that sentences like "John walked slowly" go over as

(10) (Slow(Walk))John

Parsons seems to present us with three choices in the construction of representations of adverbially modified sentences. First, we may, like Davidson, attribute to sentences of English a hidden logical form which does not coincide with its apparent grammatical form. Clark calls this the "conservative philosopher's view". Second, we may follow one of Reichenbach's proposals and, also within a hidden non-coincidental logical form, express adverbial phrases within a higher-order predicate calculus. Third, and this is the approach that Parsons advocates, we may follow the "Montague tradition" and represent adverbs as operators added to first-order predicate logic. Clark attributes this view to "radicals". The present project is, in a sense, concerned with attempting to show that conservatives still have a case in representing adverbs along Davidsonian lines. However, in view of the relationship between semantics, metaphysics and philosophy which I attempted to present in the first chapter, it would be simplistic and incorrect to suggest that the representation of adverbial modification is our only concern. In addition, we will be using certain apparatus in what follows which may suggest that we are, to a limited extent, "tinkering" with

standard logic.

To return to the proposals and criticisms embodied within predicate modifier theories, Parsons thinks there is at least one good reason why we should reject a Davidsonian theory in favour of one like his own. Consider the following sentences:

(11) John wrote painstakingly and slowly.

(12) John painstakingly wrote slowly.

The two sentences are not equivalent: the first suggests that John took pains to write and it was slow while the second means that John actually took pains to write slowly. It is claimed that, although Davidson can handle the first (a simple conjunction of predications on an event), the second cannot be accommodated in this way [1]. The predicate modifier analysis, however, is thought to portray whatever is going on in (11) and (12) rather better. Simplified representations of (11) and (12) are respectively:

(13) (Painstakingly(Write))John & (Slowly(Write))John

(14) (Painstakingly(Slowly(Write)))John

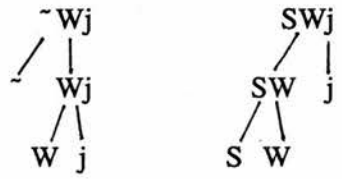
Using the apparatus of predicate modifiers, then, iterated modification can be accommodated. Syntactically, operators like "Painstakingly" and "Slowly" precede well-formed formulae forming more complex well-formed formulae. Semantically, they are seen as functions which map the properties expressed by the formulae they modify onto new properties. For example "x drives slowly", which would be written as "(S(D))x", expresses the property of driving slowly; the property that "S" represents maps the property of driving onto this property.

It will become clear in Chapter Six that sentences like (12) can be accommodated within a broadly Davidsonian framework. It looks to me as if the troublesome adverb, "painstakingly", belongs with the intentional adverbs like "deliberately" and, of course, "intentionally". As we saw in the previous subsection, it is this sort of adverb which Davidson excluded from the enquiry and which we now wish to include.

---

[1] Notice, however, that both (11) and (12) allow us to conclude that John wrote slowly. Our own analysis of adverbs, which recognises a class into which "painstakingly" falls will account for this.

The predicate modifier theory is further developed by Thomason and Stalnaker. They remark that a simple representation of a sentence in the manner of (10) is , in some sense, unsatisfactory. As it stands it bears great similarity to the standard representation of a negated sentence (c.f. "SWj" and "~Wj"). Predicate (adverbial) modification is not, it is claimed, like negation — as the derivational trees show:



In order to capture this idea, Thomason and Stalnaker propose that abstraction be introduced to the underlying formalism. This sort of measure, it is claimed, will do justice to examples whose underlying representation cannot be constructed in terms of simple predicates, such as

(15) Reluctantly, John bought gas and had oil changed.

and

(16) John intentionally kissed Mary or kissed Susan.

In (15) the idea is that John did not like performing both the buying of gas and the changing of oil; he might have been willing to do either separately. Similarly, in (16), John might have intentionally kissed the girl in the mask, knowing it was either Mary or Susan, without intentionally kissing Mary or intentionally kissing Susan. Thomason and Stalnaker suggest that, in order to capture examples like (15) and (16), we allow ourselves to build up complex predicates like "(kissed Mary V kissed Susan)" which may then be modified. The abstraction device is used to enable us to do this. To take our example sentence (16), we can, using an abstraction device, represent it as follows:

(17) (Iλx(Kxs V Kxm))(j)

where the complex predicate is represented as "λx(Kxs V Kxm)", "I" stands for "intentionally", "Kuv" for "u kissed v" and s, m, and j for Susan, Mary, and John respectively.

It is clear that, on a Davidsonian analysis, the problem about an apparent and unwanted similarity between adverbs and negation does not arise: adverbs are predicates, negation is an operator. However, the problem with putative examples of complex

predicates has not been tackled properly within a Davidsonian framework. The analysis to be presented should take account of this and suggest a way in which to go about accounting for examples like (15) and (16). It is noticeable that, once again, the adverbs involved appear to be intentional ones.

Having given an analysis of adverbs in terms of predicate modification and the abstraction device, Thomason and Stalnaker observe that there may well be two sorts of adverbs to contend with: predicate modifiers and sentence modifiers. The second sort, according to Thomason and Stalnaker, includes adverbs like "possibly", "probably", "usually" and "unfortunately". One way of identifying such adverbs is by attending to whether a target sentence can be paraphrased along the lines of "It is Q-ly true that" where "Q-ly" is the adverb in question; only sentence modifiers, it is claimed, permit such paraphrase. The present project will not have very much to say about this sort of adverbial modification although some comments will be appropriate in Chapter Six. Thomason and Stalnaker provide their extension of standard logic with a possible worlds semantics along the lines proposed by Montague. Propositions are thought of a functions from possible worlds to truth values. Sentence adverbs are therefore seen as denoting functions taking propositions into propositions, while predicate adverbs are seen as taking singulary propositional functions into singulary propositional functions.

Before moving on, it is perhaps worth mentioning that Parsons, who once thought a Davidsonian approach to adverbs was unsatisfactory, has recently altered his position slightly (Parsons 1980, Parsons 1985). He now advocates a combined approach to adverbs in which a Davidsonian conjunctive event analysis underlies an operator approach. This unification is achieved by using lambda-abstraction to enable operators to be reduced to event symbolisation, so that "slowly", for example, comes out as

$\lambda P \lambda e(P(e) \ \& \ S(e))$

Something like this could probably be done to the proposals which will result from the present project, but I believe that more work than this has to be carried out in order to gain useful insights about the behaviour of adverbial expressions. Parsons proposes a treatment for intensional adverbs which differs from his combined analysis: they are simply construed as operators which do not reduce. This is thought to take care of the opacity which a simple conjunctive event analysis will not properly accommodate. It will be part of the present study to discover whether all intensional modifiers really need to be given this non-standard analysis. Parsons does not think that we even need a Davidsonian treatment of such adverbials:

> I will not propose an account of intensional adverbials. Such adverbials raise all of the

> problems that are typical of intensional contexts in general, and many ways of dealing with these problems are well known. I think that the "underlying event" approach gives no special insight into these problems, nor does it create any special hinderances. (Parsons 1985: 249)

I disagree with Parsons' estimate of the situation. The following chapters, in attempting to unite semantics and action theory, will show that interesting results are to be gained if we do not simply assign intensional (intentional) adverbs an operator interpretation. In addition, Davidson's proposals for adverbs have advantages of simplicity and potential generality over the preceding accounts of predicate modifier theories. One aim of the thesis is to retain Davidson's insights while extending the basic framework to address problems brought up by advocates of different approaches. I now turn to a more sophisticated version of the predicate modifier account which will introduce issues concerning events.

1.3. Cresswell's contribution

This subsection contains a discussion of a theory of adverbial modification which may be thought of as an elaboration of the predicate modifier theory we have just considered. The theory is due to Cresswell who has recently drawn together a number of separate pieces of work which concern the representation of adverbs (Cresswell 1986).

It would be as well to examine the general themes and motivations underlying Cresswell's approach to adverbs and semantics. Cresswell adheres to a specific principle in the construction of an underlying formal representation for natural language (Cresswell 1974, Cresswell 1986, Chapter 1). This he calls "the proximity principle". The proximity principle simply says that it is philosophically useful to study that "level" which is the nearest level to the "surface level" at which Frege's principle of compositionality is satisfied. Frege's principle is that the meaning of all complex expressions in the language is determined by the meaning of the symbols and their mode of composition - compositionality. There is little or no argument towards accepting the proximity principle, nor is there explanation of how it is supposed to be philosophically useful. The sort of discussion which is presented in the first chapter of the present thesis, which considered the relationship between philosophical, semantical and logical issues, seems to be absent from Cresswell's work. In fact, at one place Cresswell talks about a

> prejudice of mine, which I have dignified by describing as the proximity principle, viz that one important task of a truth-conditionally-based formal semantics is to produce a formal analysis which is as close as possible to the surface. (Cresswell 1986:41)

All of which suggests that there are no real reasons, according to Cresswell, why we should not be interested in predicate logic as our canonical idiom.

The formal language which is chosen by Cresswell throughout his work, and which

he thinks satisfies the proximity principle, is a "lambda-categorial language" (which I shall abbreviate to "λ-categorial language"). The syntax may be briefly described as follows. There are two categories, the sentence category 0 and the name category 1. If t and s1,...,sn are categories, then <t, s1,...,sn> is the functor which when given a sequence of expressions s1,...,sn will make an expression of category t. The one important formation rule is expressed as follows: if "d" is of category <t, s1,...,sn> and "a1,...,an" are of categories s1,...,sn, then the sequence "<d, a1,...,an>" is of category t. Within the λ-categorial language provision is also made for the lambda-operator. The semantics of the language involves two domains, D0 and D1 (for the categories), which are propositions and names respectively. The possible worlds semantics favoured by Cresswell means that propositions are construed as sets of possible worlds. The way in which semantic definitions are written will become clearer with consideration of specific examples.

At various places Cresswell discusses the metaphysics associated with his theory. For example, the domain, D1, which is the domain of things is so construed as to allow that "things" are anything which is in one's ontology. And at times Cresswell does not seem to mind what is in his ontology, so long as the semantics "works". In his discussion of the way in which a Davidsonian approach to adverbs may be integrated within an λ-categorial framework (which we shall consider in a moment) Cresswell sees events as being sets of space-time points. This view is part of a broader approach to individuals which regards them as "manifestations" in worlds. (Cresswell has a slightly different view of possible worlds from, say, Montague and Lewis. He gives them structure, enabling him to talk of "manifestations".) It is suggested, for example, that a set of space-time points is the *manifestation* of an event in a world. The idea of a manifestation and its relation to possible worlds semantics has been put forward elsewhere in a discussion of basic individuals (Cresswell 1973). A basic individual like a physical object, an event or a state is thought of as a function, f, from a world to a part of that world — i.e. a function from possible worlds into possible worlds provided that for any world, w, f(w) is a subset of w. Now, f(w), the value of the function f in the world w, is the manifestation of f in w. We might also call it the extension of f in w.

A connection is attempted using the idea of a manifestation between actions and agents, events and things (Cresswell 1979, Cresswell 1986, Chapter 6). The manifestation of an individual in one world is roughly the form it takes in that world, and particularly crucial is the spatio-temporal position it occupies. Now, it is suggested, we may think of the manifestation of an event or activity as being identical with the manifestation of the person or thing which undergoes the event or activity. It is supposed that such an account gives us a class of physical entities neutral between events, activities and objects (a sort of common denominator) — it is the class of all functions with spatio-temporal

manifestations. This approach, which supposes a close relationship between events and objects, should not go unquestioned, and it will be seen in the next main section that the comparison between events and objects is not as straightforward as it might seem.

To return now to Cresswell's proposals for the accommodation of adverbs, an attempt is made to represent Davidson's proposals within the framework. The verb "runs", for example, becomes a two-place predicate whose semantics is

> V(runs) is the function f in D<0,1,1> such that a and b are in the domain of f if and only if a is an action and b is a person; and for any such a and b and any world w, w is a member of f(a,b) if and only if in w, a is a running by b.

The semantics of the adverb "quickly" also involves the idea of an action and in addition contains reference to a comparison class — to take account of attributivity. The semantics of "quickly" ensures that

John runs quickly.

will entail

John runs.

in the sense that the set of worlds assigned to the former will be a subset of the set of worlds assigned to the latter. This differs from Davidson's account of "adverb-dropping": there it follows from a syntactic property of the object language. We might say that Cresswell depends on the "meanings" of the words involved to allow the inference to go through. In fact, I think that this is a manifestation of a distinction between Davidson's and Cresswell's attitudes to the semantic project. Whereas Davidson is concerned to get the logical forms of *sentences* straight, Cresswell emphasises the alleged importance of word semantics. This difference in emphasis of the two projects leads Cresswell at times to advocate analyses along decompositional lines (e.g. in the case of adverbs of causation).In fact he thinks that this is the only way to get at the sort of entities our framework must postulate (Cresswell 1986:191).

The adverb "quickly" is thought by Cresswell to be of category <<0,1>,<0,1>> - a predicate modifier which takes a predicate of category <0,1> and yields a predicate of category <0,1>. Cresswell originally takes adverbs to be of category <0,0> but, faced with an apparent counterexample, allows them to modify predicates of category <0,1>. The example which he thinks causes trouble involves the adverb "willingly" and the following

two sentences:

(18) John precedes Arabella.

(19) Arabella follows John.

Since, Cresswell claims, (18) and (19) are equivalent, then , if "willing" were of category <0,0>, the following sentences should also be equivalent (which they are not):

(20) John precedes Arabella willingly.

(21) Arabella follows John willingly.

Cresswell finds the solution in making "willingly" be of category <<0,1>,<0,1>>.

There is one point, which tells against Cresswell's use of "willingly", and that is, having given the above example, Cresswell admits that, since the adverb is one of propositional attitude, he has no analysis to offer for it. At another place, he says that he has no semantics to offer for psychologically oriented adverbs like "deliberately" (Cresswell 1986:55). In view of this, the choice of "willingly" to motivate the idea that adverbs can be predicate modifiers is perhaps a little odd. Furthermore, his criticism of Davidson not providing a uniform analysis of adverbs (given the hints at a paratactic analysis for intentional adverbs) gets little purchase — Cresswell does not give any sort of analysis for a large class of them [2].

It has been mentioned before that adverbs which incorporate an intentional element are unlike other adverbs and deserve a special treatment. This should preserve whatever is "adverbial" about them while distinguishing them from non-intentional adverbs. Davidson provides a warning (Davidson 1980:121):

> It is obvious, I hope, that the adverbial form [of intentional adverbs] must be in some way deceptive; intentional actions are not a class of actions, or, to put the point a little differently, doing something intentionally is not a manner of doing it.

It is also noticeable that, on a Davidsonian treatment of (18) and (19), they turn out to be non-equivalent. The idea is to account for the behaviour of expressions in logical form, and not to provide an account for relations like synonymy.

---

[2] In another place, Cresswell does give an account of expressions which are regarded as setting up opaque contexts (Cresswell 1985), but he does not give an account of intentional adverbs.

The preceding discussion of Cresswell's work has shown that, in proposing a treatment of adverbial modification, he needed to say something regarding the nature of events. In his own theory, Cresswell claims that events can be accommodated in terms of manifestations — such a view will be cast into doubt in the section on event theories. Cresswell's attempt to recode "Davidsonian semantics" with its commitment to events in his own framework may amount to introduction without advantage. It is simple incorporation and does not explore the wider theoretical implications. In contrast, a principal aim of the present extension of Davidson's proposals is to accommodate ideas and expressions of a certain sort (those pertaining to intention and complex activity which involves apparent multiplicity of actions) within a framework which explores Davidson's tenets about language and metaphysics. In carrying this out, a certain amount of work will have to be done, but the insights gained will be valuable.

In the section on events the merits of a number of event theories will be assessed. Before moving on to that section, however, another contribution will be discussed, which claims that questions of event theory are in the offing in the treatment of adverbs, and which takes a Davidsonian approach.

1.4. Taylor's contribution

An attempt has recently been made by Barry Taylor to modify or extend Davidson's insights into the representation of adverbials (Taylor 1985). It is claimed that, as they stand, Davidson's proposals regarding the accommodation of adverbs leave something to be desired. One way of looking at Taylor's theory is to see it as augmenting a Davidsonian treatment of adverbs with an alternative theory of events. In the preceding subsection it was remarked that Cresswell committed himself to a certain view about of the nature of events. In the present case, the question of event theory has once again arisen, this time more explicitly. What follows is a brief consideration of those features of Taylor's theory which are relevant to present concerns, without delving too deeply into the proposals regarding events — a discussion of event theories will be postponed until the following main section (it will be suggested that all Taylor's proposal amounts to is the unhappy marriage of Davidson's conjunctive analysis for adverbs and Kim's analysis of events). Although we too are taking our lead from Davidson's proposals, we shall not endorse Taylor's theory.

Taylor claims that an event-predicate theory is superior to a predicate modifier theory in its handling of certain linguistic data. Sentences like

*Brutus violently did not stab Caesar.

which do not make much sense are nevertheless supplied with an underlying form by the predicate modifier theory:

Violent(λx)(~ Stab(x,Caesar)(Brutus)

The event-predicate approach, however, accounts for such deviance simply by failing to make sense of the problem sentence — no "base structure" can be supplied for it, wherever the negation sign is inserted. Taylor thinks, however, that the Davidsonian method overgeneralises in that the same manoeuvre excludes sentences like

Brutus intentionally did not kill Caesar.

Once more the irregularity of adverbs of intention needs attention. In Chapter Six it will become clear that Taylor's charge of overgeneralisation can be dealt with.

Taylor's event theory, which is supposed to be tailored to accommodating adverbs, makes essential use of the idea that a sentence is correlated with a state of affairs — a sentence describes a state of affairs, or fact [3]. We saw in the preceding chapter that Davidson eschews this blatant form of the correspondence theory; furthermore, he gives an argument is used to show that, given certain assumptions, the position is incoherent. It is claimed that if a sentence describes one fact it describes them all, or it describes the "Great Fact". Barwise and Perry have described this sort of argument as "The Slingshot" (Barwise and Perry 1983). They circumvent it by denying two assumptions that allow the argument to go through: that logically equivalent sentences have the same reference, and that the reference of a sentence does not change if a component singular term is replaced with another of the same reference. The present project will make these two assumptions and accept the Slingshot or Great Fact argument.

In attempting to get around the Great Fact argument, Taylor thinks it enough to modify the notion of "chainwise connectedness" employed in it, which is:

> Sentences S and S' are chainwise connected if S' is obtainable from S by (1) replacing sentences with their logical equivalents, and (2) substituting co-referring singular terms within sentences.

---

[3] It is this which invites Kim's event theory, since the states of affairs which are posited are assigned a structure which is derived from elements of the sentence — i.e. object, property and time. This is unlike Davidson's theory which makes events unanalysed particulars. In addition, Davidson is careful not to make whole sentences refer to events.

Taylor's move is to forbid the use of anything apart from quantifiers and truth-functional connectives in obtaining S' from S — the description operator and identity predicate are not allowed. Such a move will have to face the following criticism: it is not clear that Taylor's apparatus of states of affairs can say anything significant about redescribing what an utterance says if, in order to obviate the Great Fact argument, noone can be said to deduce logically that two descriptions are of the same state of affairs unless that deduction makes no use of the properties of identity.

One of Taylor's motivations for presenting a "new" event theory is apparently the problem of correctly rendering sentences which involve an interaction between quantifiers and adverbs: it is claimed that we require an event theory which allows for event summation. Although this point looks as if it were better discussed in the next main section, I will say something about it here for a number of reasons: it is not a major aim of the present project to come up with an account of event summation; I do not believe that the quantifier-adverb examples require an account of event summation — the phenomenon is linguistic rather than metaphysical; in addition, I think that there may well be more than one method of event composition implicit in the use of language. The problem sentences take the same form as the following example:

(22) Henry gracefully ate all the crisps.

This sentence has two readings: either each crisp was eaten gracefully, or there was overall grace in the crisp-eating compatible with the odd crisp being eaten gracelessly. These readings seem respectively to go over as:

(23) $(\forall y)(\text{Crisp}(y) \rightarrow (\exists e)(\text{Eat}(H,y,e) \ \& \ \text{Graceful}(e)))$

(24) $(\exists e)((\forall y)(\text{Crisp}(y) \rightarrow \text{Eat}(H,y,e)) \ \& \ \text{Graceful}(e))$

However, these will not do, since (24) now entails (23) — but overall grace does not entail that each crisp was eaten gracefully. To resolve this within a standard Davidsonian theory, Taylor lets

Eat(x,y-uniquely,e)

abbreviate

Eat(x,y,e) & (∀z)(Eat(x,z,e) → z=y)

so that (23) may be written as

(25) (∀y)(Crisp(y) → (∃e)(Eat(H,y-uniquely,e) & Graceful(e)))

Taylor apparently thinks that a neater way of accommodating the two sentences is available on his theory which allows event summation, in terms of sets of events sharing the same property (e.g. eating) and being temporally contiguous. The propriety of such a manoeuvre will be briefly discussed in the next main section. Before moving on it seems appropriate to make a couple of observations regarding the second reading of (22), the tricky one. First, it would be simple enough to add a predicate, "Contains", thus achieving the same effect as Taylor (paraphrasing his solution) without making his claims about the metaphysics of event summation:

(26) (∃e)((∀e')(Contains(e,e') ↔ (∃x)(Crisp(x) & Eat(H,x,e')) & Graceful(e))

In other words, there is an event which "contains" (which we think of as containing) the crisp-eating events, and it this which is graceful. The new predicate simply expresses a relation between events; it remains silent on, for example, the question of transitivity. Alternatively, we could question the quantifier's role in all this — perhaps a theory which allows us to say something like "Eat(H,all the crisps,e)" is called for. Presumably, one of these methods could be used to accommodate examples due to Richards (Richards 1976), such as the difference between:

Reluctantly, John dismissed everyone.

and

John dismissed everyone reluctantly.

Whatever ploy is used, it is likely to have special application to certain linguistic phenomena; a "general" theory of event summation is beyond the scope of this project, and is probably not the best solution to the sort of problem outlined above. In fact, in a subsequent discussion of human actions in Chapter Six, I will tentatively suggest a way of combining actions which differs from the above ways of summing events, and which is associated with another sort of linguistic phenomenon (one which Taylor's method of summation would not handle).

Having seen the sort of use of events that has been made by Taylor, Cresswell, and Davidson in accommodating adverbial modification, it is appropriate to turn to event theories in order to explore the sort of approach which we will take to events in the representational and theoretical issues of subsequent chapters.

2. Event Theory

This section discusses and categorises event theories. Having done this, proposals are made regarding the sort of theory which is to be adopted. A unifier view will be endorsed.

2.1. Multipliers and Unifiers

At the end of the preceding section, and as a result of considerations which had gone before, we saw that a treatment of adverbs invites acknowledgement and discussion of theories of events. Taylor's proposals in particular seemed to rely heavily upon a choice of event theory - in fact, Taylor's idea amounts to cementing an account of adverbs on to a possibly incompatible event theory. In order to see what is meant by this claim, two opposing sides in the "debate" over events must described. We shall call one party "event multipliers" — to be discussed first — and the other "reductive unifiers". The former view is put forward by, for example, Kim and Martin, while the principal advocate of the second position is Davidson (an earlier proposal along these lines was put forward by Anscombe (Anscombe 1957)). Taylor attempts to use the event theory proposed by the multipliers to underpin the theory of adverbs put forward by Davidson. The considerations of this subsection and the following one will, among other things, enable us to propose a classification of event theories.

I will start off with Kim's theory of events, which is the best known multiplier theory (it will become apparent as we proceed that the above distinction is not the only way of classifying theories). It has attracted the epithet "multiplier" because it requires us to distinguish between events in such a way as to acknowledge that on certain occasions more events have taken place than might appear at first blush — it multiplies the events under consideration. An example will show what is meant by this claim. Suppose that I kill Jones by shooting him, or that I cross the channel by swimming it. In each case, Kim would say, we can separate two events: the killing and the shooting; the crossing and the swimming. In other words, the criterion of identity advocated by a multiplier theory

requires us to distinguish certain events which might appear to be identical.

The theory which gives rise to the sort of result illustrated above has been developed by Kim in a number of places (Kim 1966, Kim 1969, Kim 1976). There are two ways in which the motivation for the theory can be described. One is to simply give the identity conditions that are put forward with accompanying comments on the ontological status of events; the other is to say how the resulting commitments are derived from consideration of the way in which events are explained. I shall briefly give both sorts of description.

Kim claims that his account of events is not reductive or eliminative in the sense that it says that events are reducible to other entities (Kim 1976). Rather, it is supposed to make clear the relationship between events and other "ontological categories". The conception of events arrived at (or one of the conceptions) is that events and states are exemplifications by substances (objects) of properties at a time. An event is thought to exist (occur) under the following condition:

Event [x,P,t] exists if and only if the substance x has the property P at time t.

Throughout, events are seen as complexes of a substance, property and time. Another principle, the identity condition, accompanies the existence condition:

[x,P,t] = [y,Q,t'] if and only if x=y, P=Q, and t=t'.

Elsewhere, Kim has linked the above conception of eventhood to the idea of the explanation of an event (Kim 1969). First of all, it is remarked that events themselves are not the direct targets of explanations (any more than the table at which I am writing is explainable) — what get explained are propositions or claims. For Kim, the relation between what explains and what gets explained is, among other things, deductive — entailment holds between things like sentences or statements. It is proposed that when the truth of some claim p is explained, there is a unique event, e, which is the explanandum of that explanation, an event which is uniquely related to p and which p refers to or describes. The proper targets for empirical, deductive explanations are of the form "x exemplifies P at t". Allowing for the above, we could reformulate the existence condition: To be an event is to be an entity that gets explained.

The identity condition which is associated with the idea of explanation follows from the opacity of explanations, or rather from the notion that opacity is an aberration arising from bad semantics. If we suppose that x explains y, but does not explain z, then, according to Kim, we must infer that y is not the same as z. If we were to think of y and z as designating truth values, then we would be in difficulty; for x could explain y but not z even though y and z designate the same thing. So Kim proposes that the targets of

explanations refer to or describe individual events. The criterion of identity for events is now:

> If x and y are events, then x=y if and only if x and y are explained by all the same explanations.

The claims whose truth is to be explained and which describe individual events must not simply be materially equivalent, they must attribute to the same objects the same properties at the same times in order to describe the same event (since events are the exemplifications of properties by objects at times). And this brings us back to the identity condition suggested a few paragraphs ago.

As we shall see, Kim's way of individuating events differs markedly from Davidson's: for one thing, events which Davidson would say are identical Kim would claim to be distinct. However, there seems to be a difference in perspective between Kim and Davidson. And there is certainly such a difference between Kim's project and the present project, in view of the remarks that were made in the first chapter. Kim makes the following comment (Kim 1976):

> A metaphysical theory of the sort just sketched must be distinguished from a theory of the "logical form" of event and action sentences... of the sort initiated essentially by Donald Davidson in an influential series of papers. (p.163)

In the first chapter it became clear that we do not hold with such a distinction in the present enterprise.

There are other features of this version of the multiplier theory which are relevant to our concerns and which should be mentioned before we move on. In saying that events are complexes of objects, properties and times, the question arises of what sort of location an event is thought to have. The temporal location is made explicit in giving the structure of the event, but the question of spatial location remains. Kim thinks that we do not locate events as such, rather we locate events by locating the objects which undergo them. Events, then, are located derivatively (Kim 1966). The spatial identity of event and object undergoing it is reminiscent of Cresswell's earlier proposals concerning "manifestations". Other writers, including Davidson at one place, have made similar speculations. A subsequent subsection will demonstrate that events and objects are not as comparable as is usually thought.

Although Kim thinks that killings and shootings are distinct, he is less severe on examples which include adverbial modification. For example it is less clear that Smith's stroll and Smith's leisurely stroll are distinct, even though two properties are arguably

involved. Kim acknowledges this by saying that, although the events are different, they are not entirely distinct: the latter "includes" the former. It looks as if "inclusion" is very much like Goldman's generation relation, which will be discussed in Chapter Four.

Another multiplier theory is proposed by Martin (Martin 1969). Here we are told to admit physical objects as the fundamental ones and then build up events as constructs. Once again events are seen as triples of object, property and time. However, further "construction" is possible: building complex events out of atomic ones using the idea of a logical product. This seems to allow too much freedom in building up complex events, and in any case, as with Taylor's attempt, I am not convinced that our semantical project requires this sort of metaphysical construction — certainly not if it cannot be done in a general and satisfactory way. The way in which Martin deals with shooting/killing examples is to say that they too are logical products. This summation means that such examples are to be treated in the same way as, for example, a motor accident which would be composed of a skidding, a collision and an overturning. It is not clear to me that the two sorts of examples are sufficiently alike to be treated in the same way.

The sort of theory which is usually thought to represent the other side of the coin in discussions of events is labelled "reductive unifier". The main advocate of it is Davidson (Davidson 1980). A principal difference between the two may be illustrated by the examples which the multiplier theory viewed as involving two events — i.e. the shooting/killing sort of examples. Quite simply, on Davidson's event theory such examples require the acknowledgement of one event only. For instance, when I shoot Smith, who subsequently dies, there is a shooting and a killing, and the killing just *is* the shooting. The events which Davidson theorises about, and about which he makes claims as to their "unifying" properties, are the "same" events which cropped up in the analysis of the behaviour of adverbial modification. By which I mean to say that the event theory and the theory of logical form are closely associated with one another. The sort of relationship that I have in mind has been outlined in the first chapter.

In common with other theories of events, the unifier view, as represented by Davidson, provides a criterion of identity for events. The Davidsonian criterion is quite different from attempts mentioned previously (and from the proposals to be covered in the next section), although Davidson does not seem to want to rule out a spatio-temporal criterion (Davidson 1980: 179). Instead of relying on a (species of) spatio-temporal sameness, it is held that identical events must be alike with respect to all their causes and all their effects:

> (x=y if and only if ((z)(z caused x ↔ z caused y) and (z)(x caused z ↔ y caused z)).

There is an immediate objection to be faced by such a criterion, which involves the charge of circularity. The above criterion of identity makes use, on the right hand side of the main biconditional, of the concept of an event. However, since that side of the condition is meant to tell us what it is to be an event — meant to give us the desired understanding of "what it is to be an event" — our understanding of it cannot depend on our already understanding what it is to be an event. The force of this objection, or an objection like it, will be reconsidered in the final subsection of the chapter. However, an idea for how such a problem might be circumvented is hinted at in "The Individuation of Events" (Davidson 1969a):

> What I do want to propose is that the causal nexus provides for events a "comprehensive and continuously usable framework" for the identification and description of events analogous in many ways to the space-time coordinate system for material objects. (Davidson 1980: 180)

In the same essay, Davidson rather confusingly says something which would fit in well with a theory which advocated a spatio-temporal criterion of identity. (As we shall see, Davidson has entertained a spatio-temporal theory suggested by Lemmon.) The remark (p.176) concerns the difficulty found in locating an event in space. We are advised not to locate an event with respect to a substance undergoing change, but to consider only the location of the smallest part of the substance, a change in which is identical with the event.

One of the reasons why the unifier theory is thought to be an improvement on the multiplier theory is that certain events which we would commonly think of as identical do indeed turn out to be the same. The examples we have come across mention shootings and killings, crossings and swimmings, arm-raisings and signallings etc. Even if we are not convinced in these cases, there are others which are even more certain to acknowledge only one occurrence. For instance, suppose that, having offended you in some way, I apologise — I come up to you and say that I apologise for what I have done. Now, although we would be inclined to support the unifier theory in this case, a theory like Kim's would require us to say that apologising and saying "I apologise" are in this case different events.

2.2. Modifications

We have seen that there are at least two categories into which event theories can fall: multipliers and unifiers. Each has been illustrated using the theory of one of its advocates. However, the complete classification of event theories is not as simple as this. There is another way in which the categorisation of an event theory can vary, and this may be

illustrated by considering two other theories which are related to the ones already discussed. Having considered these, it will be possible to classify the event theories in which we are interested and then say how we are to conceive of events and why. The following discussion involves two views of events which represent positions which are orthogonal to the ones discussed earlier. This time we can classify theories according to whether they are "particularist" or "structuralist". It is possible to think of Davidson's theory, which advocates that we think of events as unanalysed concrete particulars, as particularist, and Kim's theory, which treats events as complexes or structures, as "structuralist" [4].

Myles Brand has proposed a theory of events which treats them as particulars but which differs in important ways from Davidson's (Brand 1976, Brand 1977, Brand 1979). The particularist theory he advocates has features in common with the structuralist theories of Kim and Martin. This is a consequence, I believe, of Brand's acceptance of a similarity in the nature and identification of events and objects. For example (Brand 1977):

> Physical objects and events are alike in that they are, essentially, spatio-temporally locatable. (p.329)

This concept of the location of events has cropped up before: Davidson seemed unsure about it, and Kim endorsed something like it, while adhering to a structuralist position. If both events and objects are spatio-temporally locatable, then, from our previous discussion, at least two important questions are in the offing: on what grounds are events to be distinguished from objects, and what consequences does the criterion of identity which results from such a view have for the identity of certain events?

In order to become quickly acquainted with Brand's event theory, it would be as well to state the criterion of identity for events (where r ranges over spatio-temporal regions and W is "occurs within"):

$$e=e' \text{ if and only if Necessarily}(\forall r)(eWr \leftrightarrow e'Wr).$$

In other words, while physical objects are identical if and only if they have the same spatio-temporal locations, events are identical if and only if they *necessarily* have the same spatio-temporal locations. The reason for this may be illuminated with one of Davidson's examples, which is designed to show that sameness of spatio-temporal location is not enough to secure identity between events. Consider a metal sphere which is suspended

---

[4] I use the term "particularist" in the same way as Michael Tye (Tye 1979) to signify theories which do not hold events to be structures or complexes. I assume that in the account to be presented we do not think of events or actions as universals.

above the ground. We could imagine that the sphere is rotated at the same time as being warmed — assume that the heating does not cause the rotation, and the rotation does not cause the sphere to heat up. Then we have two events which occupy the same spatio-temporal region: the sphere's rotation and the sphere's becoming warm. Now, since distinct events can have the same spatio-temporal location, it is presumably not logically required that one occurs if and only if the other occurs. If e and e' are distinct but occur at the same time and place, then they could have times and places which are different. But, according to Brand, if e and e' occur and have the same spatio-temporal locations in all the same possible worlds, then they are the same event.

Lombard attributes to Brand the claim that the condition of identity for events given above is also satisfied by objects (Lombard 1986: 67). This seems dubious: Millard Fillmore may have been the thirteenth president in this world, but there are possible worlds in which he did not hold that office. In other words, one object may be identical with another in the actual world, but they may not share other possible locations. Whether or not we agree with Lombard on this interpretation of the theory, it serves to introduce the issue of the relationship between events and objects. Rather than one sort of entity being dependent upon, or constructed out of, another, Brand claims that:

> On the necessary spatio-temporal coincident particularist theory, events are not ontologically dependent on physical objects; there are, rather, two kinds of particulars having ontological parity. (Brand 1977: 336)

In making this sort of claim about ontological parity, Brand makes the assumption that both events and objects are related to space and time in the same way. In the next subsection, we shall suggest that events and objects are related to the spatio-temporal framework in different ways.

Brand's account of event identity is complicated by an attempt to deal with the following problem. His criterion of identity has the consequence that the following events will be judged to be distinct when they are, in fact, identical:

Nixon's resigning.

The 37th president's resigning.

This is because there is a world in which Nixon resigns, but the person who is the 37th president does not. To prevent this from happening, Brand imports Kaplan's "Dthat" operator (Kaplan 1978) to "rigidify" all singular terms which appear in the event description. So, "the 37th president" now picks out the same individual in every possible world. In spite of this measure, it is possible to label Brand's theory as a multiplier theory. For example, where a unifier theory would treat the following events as identical,

Brand's theory does not:

Jones raising his arm.

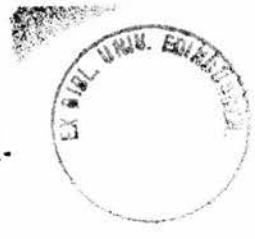
Jones signalling.

(where we would say that Jones signalled by raising his arm). There are, Brand points out, possible worlds in which Jones raised his arm but did not signal, and possible worlds in which he signalled but did not raise his arm. By Brand's lights, the events are distinct, and so Brand's theory is a fine-grained or multiplier theory.

To return to our cross-classification of events (event theories), it is now possible to show how such a theory can vary along two axes, and where the theories which have so far been discussed fit into this scheme. The following diagram does this.

	Particularist	Structuralist
Unifier	Davidson	(Lemmon, Lombard)
Multiplier	Brand	Kim/Martin

The above diagram does not cover all the possibilities — there is a view of events, labelled "the moderate theory" by Lawrence Davis and supported by, for example, Thalberg (Thalberg 1977), which claims to fall midway between unifier and multiplier. However, it will be more appropriate to mention this in Chapter Four when we concentrate on actions. The question remains whether there is a plausible theory which assigns events a structure, yet requires certain events to be identical rather than distinct — i.e. a theory which fits into the top right-hand space ("structuralist-unifier"). One theory which fits the bill is due to Lemmon (Lemmon 1967), and has been expanded upon by Bennett (Bennett 1985). Lemmon simply holds that if two events occupy the same spatio-temporal region, then they are the same (Bennett thinks of this as mapping events onto space-time pairs). So, on one interpretation, my walking and my singing "Come fly with me" could be thought to be the same event. As Bennett points out, in spite of his example of the sphere, Davidson has endorsed a version of Lemmon's theory at one time (in a recent essay he gives it further support (LePore and McLaughlin 1985)). Another theory which seems to fit into the same space is due to Lombard (Lombard 1986). This looks more promising from our point of view, and we shall have more to say about it in the next section.



2.3. Assessment

The foregoing discussion and subsequent classificatory scheme has given us a number of options and leads to follow in our choice of event theory to supplement the semantical part of the project. Taylor's attempt to yoke together a Davidsonian theory of logical form and structuralist-multiplier theory of events (c.f. Kim) is unsatisfactory for a number of reasons. This is partly to be expected from a set of proposals which is the result of the union of two, usually opposed, theories. At the end of the last main section reservations were expressed concerning the appeal to event metaphysics in order to explain a recalcitrant linguistic phenomenon, viz Taylor's summation of events to deal with certain quantifier-adverb interactions. As well as judging that the phenomenon does not substantiate such a move, we would also require of this sort of metaphysical construction that it generalise in an appropriate way. As well as allowing us to construct a big crisp-eating event out of individual crisp-eatings, we should want to know how other, non-property-sharing events coalesce. Not all event-construction is dependent on atomic events being of the same sort. For example, it is not clear how Taylor's principle would apply to Martin's example of the motor accident. To take another illustration, a theory of summation along the lines suggested by Taylor would not tell us why we consider the death of Picton to be "part of" the event that was the Battle of Waterloo.

Regardless of problems of event summation for a semantic project, we may be leery of taking on board a structuralist theory, in view of certain remarks made in the first chapter. There we attempted to elaborate on the idea that, in the present circumstances, we are interested in a metaphysics which is appropriate to the semantical programme. It may be felt that, in embracing a structuralist theory, we could be liable to pay too high price for any semantic advantage that may be gained. Clearly, in augmenting a Davidsonian theory in this way we shall have to take care that certain central themes are not swept away unnecessarily. Later on in this section, we shall discuss a promising candidate, developed by Lombard. Before that, however, I return to Lemmon's position, mentioned at the end of the last section.

In view of what has already been said, we may be tempted to augment a Davidsonian theory of logical form with a structuralist theory which is also a unifier theory. This may be thought to keep any advantages which Davidson's theory has, while eschewing the apparently circular identity criterion. A view of events which fits this bill, as suggested above, comes from Lemmon. In fact, Davidson seems at times to have thought favourably of such a theory. An attempt has been made by Bennett to combine the two (Bennett 1985). As we remarked earlier, Lemmon treats the individuation of events as being like that of bodies — events are mapped onto substance-time pairs — so that on a

certain occasion a walking just *is* a learning. Bennett rightly points out that, under such circumstances, retaining Davidson's analysis of adverbs, unwelcome results follow. For example, we may say

There is a walking by John which is slow.

but because of the identity noted above we are committed to

There is a learning by John which is slow.

So, if John walks slowly, then he learns slowly — which is incorrect. There is a general difficulty here which resides in the attributivity of adverbs, which we shall address in our own theory, but there is another specific problem: the Bennett-Lemmon proposal does not respect any distinction between the following examples.

John learned French while working hard.

John learned French by working hard.

According to Lemmon, both examples have an equal status, in spite of the fact that in the first John's learning French and his working hard are unrelated, while in the second we might want to say that learning French and working hard are related, perhaps identical. The second example is akin to those which help to account for the unifier-multiplier distinction, whereas the first is not. We can conclude from this that Lemmon's criterion is not restrictive enough — it unifies too many events — and it takes no account of whatever it is that "by" does.

I think that there is a certain problem affecting a number of theories of events so far discussed, including Lemmon's and Brand's. The problem concerns specifically those positions which draw upon an alleged analogy between events and objects for their claims that events are to be individuated in spatio-temporal terms. In this respect it could potentially affect a theory in any one of our four categories. The idea that the spatio-temporal framework is misapplied in the case of events derives from insightful remarks made by Hacker (Hacker 1982a, Hacker 1982b). Interestingly, Lombard uses such considerations as part of the motivation for his account which, instead of relying on a similarity between events and objects, takes to heart the idea that change is at the core of the concept of an event (Lombard 1986). As we shall see, he does not use spatio-temporal

coordinates in his criterion of identity.

As mentioned, it is possible to question the usefulness and legitimacy of the analogy between events and objects. For the moment I leave aside consideration of the theoretical benefit of making one "dependent upon" the other. It is too often assumed that objects and events, being real world entities, *exist* in space and time (criteria of event identity are sometimes expressed in terms of event existence). Whereas we are on reasonably firm ground when we say that Louis XIV existed, it is definitely odd to say that the death of Louis also existed. What *happened* was that Louis XIV died. In the same way that it seems incorrect to say that both objects (substances) and events exist, the alternative manoeuvre of making objects event-like will not work. It is surely nonsense to say that Louis XIV happened. I can say something like "He happened upon the world stage", but this is a shorthand acknowledgement of some act of his, or some event which befell him. As Hacker remarks, it is the "being" of events to happen or occur, not to exist.

Such a distinction obtains because events and objects are related in different ways to the spatio-temporal framework. For example, taking the spatial dimension, events, unlike objects, do not occupy space: they occur in space. It is true that events require space to take place; however, although an arm-rising needs space, it does not occupy space (only the arm does that). In addition, taking the temporal axis, it must be conceded that, whereas events take time (or take place at a time), objects exist at a time.

It has been observed that Lombard's account rejects theories of events such as Brand's due to considerations like the above. At the end of the previous section, it was conjectured that Lombard's view of events seemed to fit into the same part of the classificatory diagram as Lemmon's. However, there are a number of features associated with Lombard's work which make his theory quite different from Lemmon's and which may mean that he fits into the classification less straightforwardly than the others. We shall find that, in view of the shortcomings of Davidson's causal criterion, we should look to Lombard's event theory as more suitable (unlike Davidson, who supports Lemmon).

Lombard proposes the following criterion of identity for events (Lombard 1986: 180):

> Necessarily, for any entities, e and f, if e and f are events, then e=f if and only if e and f have all the same canonical descriptions.

Before giving more detail, we may note that the criterion recognises a distinction between events and their descriptions; broadly speaking, this is in accord with a Davidsonian theory of action which relies on actions falling under descriptions. Lombard points out that, although the criterion is cast in terms of descriptions, it does not tie event identity to linguistic considerations and could be formulated differently. As we shall see in a moment, it is just meant to summarise the idea that basic events are identical if and only if they fall into the same basic event types, and have the same objects and times (they are exemplifyings of the same atomic dynamic properties, where these are distinguished from static properties, e.g. weighing ten pounds - "the dynamic property is just the the property of first having then lacking (or having another) static property" (Lombard 1986: 105)).

Canonical descriptions pertain to "basic" or "atomic" events and actions (which compose events and actions), and are given as singular terms of the following form: [x,f,t]. Here x and t are atomic object and time respectively, while we are able to read off the "property essence", f, from the canonical description. On the face of it, this is very reminiscent of Kim's structuralist event theory; in fact, Lombard says "we [Lombard and Kim] both more or less accept the idea that events are exemplifyings of properties" (Lombard 1986: 182). However, there are some considerations which distinguish the proposal from Kim's and make it more suitable for incorporation into a Davidsonian framework. It is important that canonical descriptions cannot just be derived from any event-reporting sentence of the form "x f-s at t", as Kim might suggest in providing a multiplier theory. The only descriptions which Lombard is interested in are the ones which describe basic or atomic events (appropriate definitions are given for "atomic objects" etc, while events are explained in terms of movements by an object in an atomic quality space of simple properties; objects, events, etc are atomic for a theory, T).

Since Lombard does not make whole sentences refer to events in the same way that Kim does, and since he does not advocate the accompanying multiplier theory, there is room for him to take advantage of Davidson's intuitions about event identity. Lombard contends that, since disputed cases of identity — e.g. shooting/killing, extending arm/signalling, running of a mile in three minutes/breaking the record — are not instances of two basic action-events (property essences), it does not follow that multiplier claims are true. If we take it that the members of each pair have the same basic/atomic events (as Davidson may do), then we could claim identity. Lombard, in sympathy with Davidson's proposals, says that, in advance of such a resolution, we can and we do make some good guesses, and back them with good reasons. Lombard actually supports the sort of identity claim in which we are interested. In doing so, he acknowledges, for example, that the bell's shattering of the glass is the event that caused the glass to shatter, thus allowing the bell's chiming and the bell's shattering of the glass to describe the same event. (He notes that it is important to distinguish the "result" sense of "the bell's shattering of the glass" with the "process" sense, appealed to above, i.e. we should not confuse events and their effects.)

Lombard's theory looks like the sort of account which could profitably be incorporated into Davidsonian theory. It has already been pointed out that Davidson's causal criterion of identity for events is circular (since causes and effects are themselves events). In addition, as Brand has argued, the criterion may be false: a particle's undergoing fission followed later by its fissioned parts fusing would be a counterexample, since there would be distinct events (the motion of one part of the particle between fission and fusion, and the motion of the other between fission and fusion) with all the same causes and effects (Brand 1976). Bennett points out that, due to the inadequacy of Davidson's causal criterion and his partial endorsement of Lemmon's proposal (which unifies too many events), we need to look for the sort of intermediate position between Lemmon and Kim which respects Davidson's

claims of identity (Bennett 1985). (We should note that Lombard's theory is an advance over Lemmon's since it allows that an object can change in more than one respect at a time, resulting in two events.) I suggest that Lombard's theory is a promising candidate, and may, with further work and suitable modification, be incorporated into the Davidsonian framework. In view of what has been said, we should endorse Lombard's criterion of identity rather than Davidson's causal account, in anticipation of a full working out of the theory.

Before moving on, it is worth making a brief comparison between our approach to events and semantics and the sort advocated by Parsons in his recent modifications to Davidson's proposals (Parsons 1980, Parsons 1985). His perspective is different from the present one, as the following quotation demonstrates:

> I will address certain issues that have been much discussed in the literature concerning events and their individuation. But instead of trying to settle some of these issues by abstract philosophical argumentation, I will focus on what events would have to be like in order for the theory given here to be a good one. (Parsons 1985: 260)

If we read "abstract philosophical argumentation" as "metaphysics", then the view expressed above is at odds with our contention that there should be co-evolution of semantic theory and metaphysics. Parsons view means that he ends up with a theory which only partly coincides with our own on questions of event identity. For example, my murdering the guard is my killing the guard: this is because there is a "certain natural supplement" which is to say that every murder is a killing. However, he denies that if I pour poison into the water supply thereby killing the people, then the pouring and the killing are the same event. Denials of this sort are partly based on "Wallace's problem" which will be discussed in Chapter Six. Our own theory has a different orientation, doing without "natural supplements" or generalisations.

Other places where the two accounts differ is in the separation of actions and events, and the further subdivision of events. Parsons' theory has as a consequence that, for example, Agatha's breaking of the window is the same as the window's breaking, and that Agatha's sinking of the Bismark is identical with the Bismark's sinking. As I mentioned above, the introduction of agency to "bare" events creates a quite different species of event. This will become clear in Chapter Four. Parsons also recognises a clear distinction between events and states; we shall reconsider this briefly in Chapter Six.

Conclusion

Having endorsed a Davidsonian account of adverbs and action sentences, the first half of this chapter illustrated the sort of problems which have been thought to arise for such theory. It was suggested that an account of these phenomena would need to acknowledge an event theory. The second half of the chapter enabled us to settle on a theory.

In subsequent chapters the problems which have been thought to arise for "Davidsonian Semantics" will be addressed. The considerations of the first half of this chapter will be of use to us in what follows because the constructions in which we are

interested fall mainly within the class of adverbs. In the second part of the chapter, which dealt with theories of events, it was concluded that, with respect to the "metaphysics" of events, we should endorse a Lombardian-unifier version of Davidson's proposals. In Chapter Four semantical considerations will again be brought to bear upon the question of event theory. In that chapter we shall also be concerned with human action as a species of event.

From the preceding discussion of adverbs, it is clear that the phenomenon of intensionality, associated with intentional adverbs, should be addressed within the approach that we are advocating. Chapter Three contains a discussion the manoeuvre which has been thought to account for intensionality by Davidson and others. In addition, the related topic of demonstrative constructions will be discussed. Such considerations bear on representational issues presented in Chapter Six.

CHAPTER 3

Parataxis and Demonstrative Constructions

Introduction

In the course of the discussion of adverbial modification in Chapter Two, it became clear that intentional adverbs, which are among our target expressions, require a different treatment from other adverbs. One of their important characteristics is that they create intensional contexts. In order to accommodate such constructions within a Davidsonian framework, a method of dealing with intensional contexts is required. This chapter contains an examination of a proposal made by Davidson — the paratactic manoeuvre — for the treatment of seemingly non-extensional contexts. The discussion will cast doubt upon Davidson's proposal as it stands as a suitable way of dealing with this phenomenon.

In addition, the related topic of demonstrative constructions will be examined, since it will become clear (in Chapters Five and Six) that certain of our target constructions involve an element of indexicality. A number of ways of representing this phenomenon within a Davidsonian framework will be considered before one is endorsed.

Together with the previous chapter, this chapter constitutes a discussion and assessment of the representational apparatus at the disposal of the theorist working within the Davidsonian framework.

1. Parataxis

1.1. The proposal

Davidson's paratactic proposal is principally articulated in two of his papers (Davidson 1968, Davidson 1979). The subject of the first of these is the accommodation of oratio obliqua, or sentences of indirect discourse, within "Davidson's programme". The traditional problems of this phenomenon which have been associated with the propositional attitudes in general, such as apparent failure of extensionality, provide the motivation for the attempted domestication of oratio obliqua — given views expressed elsewhere, questions concerning extensionality are of considerable interest to Davidson. The way in which the logical form of a sentence of indirect discourse should be approached is given in general terms as follows (Davidson 1968).

> The proposal then is this: sentences in indirect discourse, as it happens, wear their logical form on their sleeves (except for one small point). They consist of an expression referring to a speaker, the two-place predicate "said", and a demonstrative referring to an utterance. Period. (p106)

The example sentence which receives the most attention, both in this article and elsewhere, is

(1) Galileo said the earth moves.

We are encouraged to look upon this as

(2) Galileo said that. The earth moves.

(where the "that" is a demonstrative singular term referring to an utterance) and observe that the appearance of failure of extensionality (the laws of extensional substitution) is now explained as due to our mistaking what are really two sentences for one. When we make substitutions in one sentence (the "content sentence") it is the (utterance of) the other one which is liable to change of truth-value. We can illustrate why it is important to look upon the proposal as *paratactic* with the entry for "parataxis" in Chambers Twentieth Century Dictionary where it is described as

> the arrangement of clauses or propositions without connectives

and being derived from the Greek for "beside" ("para") and "arrangement" ("taxis"). Consequently, what follows the utterance of the first sentence in (2) is not contained in the sentence "whose truth counts", i.e. the sentence which ends with "that", and we may say that the two utterances are semantically independent.

However, as critics and commentators have pointed out, there is more to Davidson's suggestion than this. Associated with the above remarks concerning the strategy taken on questions of logical form is a suggestion about the way in which the predicate "said" should be paraphrased. The idea involved here is that of "samesaying".

> [W]hen I say that Galileo said that the earth moves, I represent Galileo and myself as samesayers. (Davidson 1980:104)

When I utter the words "The earth moves", an utterance of mine matches an utterance of Galileo's in purport; I am "saying the same thing" as Galileo. There is apparently no problem in recognising that we are samesayers. Given this, the following seems to convey the right idea.

(3) The earth moves. $(\exists x)$(Galileo's utterance x and my last utterance makes us samesayers).

"Definitional abbreviation" and "reversing the order of things" takes us from (3) to (2), which is the parataxis appropriate for the logical form of (1). Davidson feels that samesaying pertains to issues of analysis (of predicates), while the paratactic arrangement itself is a matter of logical form. We shall return to this general distinction in later chapters, but further on in the present chapter we shall see that, in the case of the paratactic manoeuvre, questions of analysis and logical form have a bearing on each other.

So far, only the case of oratio obliqua has been considered, but there is another natural language phenomenon for which the paratactic manoeuvre is thought to be apposite. The treatment of the moods of English (Davidson 1979) once again involves parataxis. In the course of the proposal the question of the analysis of the truth conditions of utterances of words like "Jones asserted that it is raining" comes up (p118). Once more, it is suggested that we view such an utterance as the utterance of two sentences: "Jones asserted that" and "It is raining". The function of the "that" in an utterance of "Jones asserted that" is to refer to the following utterance which gives the content of Jones' assertion. The following paraphrase is the effect of an utterance of "Jones asserted that it is raining".

Jones made an assertion whose content is given by my next utterance. It is raining.

The usual failure of substitutivity in attributions of attitude is accounted for because the reference of "my next utterance" changes with any change in the following utterance. In both this and the previous suggestion concerning indirect discourse it has not been necessary to invoke any "non-standard semantics". There has been no resort to intensional logic, or to "propositions". That there are problems within the present proposal will become clear in the next section.

1.2. Problems

What follows is a description of some of the difficulties which have been said to confront Davidson's paratactic analysis. These problems will motivate an alternative to the Davidsonian proposal outlined above. This different approach will be presented in subsequent subsections.

Higginbotham has made a number of observations and criticisms regarding Davidson's theory (Higginbotham 1986). Firstly, it is claimed that the "that" of indirect discourse, the behaviour of which is central to the theory, is to be regarded straightforwardly as a complementiser rather than as a disguised demonstrative. Along with this, it is remarked that, if oratio obliqua does involve a concealed demonstative, we should expect it to behave like an overt demonstrative which, it is claimed, it does not. The point

is supported by an argument from Stich (Stich 1983). The claim that reporting a saying (or possibly a belief) is analogous to indicating an inscription (or utterance) which is sometimes thought to be attractive is actually a source of a problem since "indications of inscriptions are sealed off from any interaction with linguistic elements in main clauses" (Higginbotham 1986:39). Suppose the speaker points to an inscription of

He is a nice fellow.

and says

Every boy believes that.

There is one reading that this act of demonstration cannot capture: every boy has a good opinion of himself. Clearly, this idea can be conveyed by "Every boy believes that he is a nice fellow". It is also remarked that this sort of objection does not disprove Davidson's theory, but that in order to account for it we might have to say that concealed demonstrative constructions show one array of data, while overt ones show another.

Observations made by Platts are related to those made above (Platts 1979). They concern the question of quantifying into the content sentence from outside the construction. For example, if we want to say that there is something which Galileo said moves we must do just this. However, the following representation will not do

(4) (∃x)(Galileo said that. x moves).

Here, objectual quantification means that the quantified-in sentence would be true in virtue of a certain object *however described* i.e. we should be committed to the truth of (4) where the referential slot is filled by any designation of the earth. Note that (4) is distinct from the "de dicto" reading of the sentence which would come out as

(5) Galileo said that. (∃x)(x moves).

and which is usually regarded as unproblematic. A number of possible solutions are discussed and rejected, for example:

(6) (∃x)(Galileo said of x that. x moves).

(7) (∃x)(Galileo said of x that.) x moves.

(8) (∃x)(Galileo said of x that.) It moves.

In the case of (6), it is suggested that the "grammaticality" of the sentence will suffer since for the two occurrences of the bound variable, one is in an asserted sentence, while the other is in a said sentence. The variable in the content sentence of (7) is quite unconnected with the quantifier, and so no "quantifying-in" seems to have taken place. Apart from these specific objections to (6) and (7), any move which involved a variable in two sentences being bound from the outside looks dubious to Platts. The use of a pronoun in (8) requires a semantic treatment of that pronoun whereby it does not collapse into (6) or (7). Proposals due to Burge and Hornsby, which will be discussed shortly, will address this sort of problem.

Burge has cited two problems which affect Davidson's theory (Burge 1986). The first of the problems which Burge thinks threatens Davidson's standard account is alleged to arise because the entities which Davidson appeals to as the referents of "that" in "says that" do not seem appropriate for the complexity of mentalistic discourse, or for certain quantifications on indirect discourse. Problems arise, Burge claims, because Davison's account of what is said is nominalistic: "It appeals only to concrete entities as truth-bearers" (Burge 1986: 198). In view of this, Burge recommends that we regard natural discourse as as quantifying over abstract objects in the relevant cases. The alternative account that we shall be endorsing in this chapter represents a break from Davidson's extreme nominalism.

The other problem for Davidson's theory as it stands is that it fails to capture the validity of certain arguments, namely those which are usually regarded as trivial such as "p; so p". An instance of this schema is

(9) Galileo said that the earth moves; so, Galileo said that the earth moves.

(i.e. Galileo said that. The earth moves; so, Galileo said that. The earth moves.)

In (9) each utterance of the supposed demonstrative "that" picks out a different utterance (a different token). So, on Davidson's account, the argument does not come out formally valid: we cannot infer from p that p. In order to explain the validity, one would have to enter further premisses about the relation between the two occurrences of the demonstrative "that", or an extra premiss about its referents. In the next subsection, a modification to the standard account will be discussed which acknowledges this difficulty.

The last criticism to be considered is due to McFetridge (McFetridge 1976) and is similar to Burge's final criticism mentioned above. It can be illustrated by the following

dialogue.

A: The earth moves.
B: Galileo said that.
C: The earth moves.
B: That's *another* thing Galileo said.

In counting things that Galileo said, something seems to have gone wrong. The use of "another" does not seem to be correct, but on Davidson's account B's comment would be in order. Once again, this is because each occurrence of the demonstrative "that" picks out a different utterance of "The earth moves". The next section deals with McFetridge's own response to this problem as well as other modifications to the paratactic analysis. Among other things, it will be suggested that a proposal due to Hornsby can cope with McFetridge's problem, but that something like McFetridge's own proposal is needed to circumvent Burge's problem example.

1.3. Reactions

This section considers the suggested extensions and modifications that have been made in answer to criticisms of the sort discussed in the preceding section. Use will be made of two suggestions to counter criticism of the sort voiced by Higginbotham and Platts, on the one hand, and Burge and McFetridge, on the other. Features of the two suggestions together point towards an amended proposal. To begin with, we will look at a way of dealing with the sort of problem brought up by Burge and McFetridge.

The final part of the last section was concerned with McFetridge's treatment of the paratactic analysis of sentences of indirect discourse. The problem that we are concerned with here is that "each appropriate utterance of "The earth moves" is a distinct thing to which Galileo stands in the saying relation, i.e. a distinct thing said by Galileo" (McFetridge 1976:136). The mistake that is attributed to Davidson can be described as an unwarranted move from (a) to (b):

(a) the referent of a demonstrative singular term *is determined by* some feature of the context of utterance.

(b) its referent, on a particular occasion, *is* some feature of that context; e.g. some object present in that context.

McFetridge proposes that the second term of the predicate "said" — the referents of "that" — should be entities which "utterances can be of"; the variable in (∃x)(Galileo said x) should be seen as ranging over such things. In other words, things said must be things utterances can be of, not utterances themselves. Such a move looks like a challenge to Davidson's nominalism. However, further elaboration is necessary before our Davidsonian theory can endorse sentences like the following.

(10) (∃x)(Galileo's utterance x is of that proposition)

In order to give an acceptable character to propositions, McFetridge finds that he must look at both the logical form and the analysis proposals. (A number of of writers in the Davidsonian tradition, like Burge (Burge 1977), mention propositions but do not give any account of them.) So, in addressing difficulties with parataxis, there seems to be one place in which analysis and logical form run close together, although this does not mean that the results of an analysis proposal will be explicitly included in a logical form. Rather, addressing questions of analysis will assist in determining what the logical form of certain certain sentences should look like (c.f discussion of Bach in the first chapter). In Chapter Five and Chapter Six, the same sort of considerations will help to accommodate the behaviour of the verb "refrains" within our theory.

Given that the samesaying relation is of the following form

$$\text{samesay}(\text{speaker}_1,\text{speaker}_2,\text{utterance}_1,\text{utterance}_2)$$

and it is made explicit that the utterances must be made by the relevant speakers, then, according to McFetridge, we just need to concentrate on the two-place relation between the utterances (i.e. "has the content of"). To this effect, it is suggested that one utterance could be used to "report" another, where "reports" means something like "has the content of". In fact, whatever interpretation is given to the relation, the problem remains that distinct utterances "reporting" Galileo's utterance will still be distinct things said by Galileo. Within the present framework, the most plausible candidate for "propositions" will be classes of utterances (a certain sort of abstract object). More specifically, each class is a class of utterances which "report" each other. It now remains to link this proposal with Davidson's original paratactic proposal.

At this point, Quine's notion of deferred ostension is introduced (Quine 1969). The idea is that, in picking out a particular class, we perform an act of demonstration in the presence of one of its members; while the presence of an utterance or inscription aids in determining the referent of the demonstration, the utterance itself is not the referent. For example, different utterances of "That is alpha", in the presence of different concrete

inscriptions, are to be taken as involving reference to the same thing, alpha — a letter which different inscriptions can be of. With this in mind, the new conception of "proposition", qua class of utterances, is defined as follows:

> A class of utterances sufficiently alike for there to be at least one utterance which reports all and only the members of that class (such an utterance "binds" the utterances it reports).

So, in attributing a saying we shall be stating that the reported utterance is a member of the class of utterances bound by the ensuing utterance. The following diagram conveys this idea:

Galileo said that.
↓
The earth moves.
↓
{x|x is an utterance bound by "The earth moves"}

McFetridge's idea of "proposition" is a rough guide to the sort of thing that we require. However, the notion of one utterance reporting another is a little vague and may need some further explanation. We shall return to a version of this proposal in a moment, and attempt to ground the idea of a proposition out in something more respectable.

Another line of criticism is taken up by Hornsby (Hornsby 1977). This is the alleged inability of the paratactic theory to be able to cope with the "relational" sense of sentences of propositional attitude (this arose in the preceding discussion of criticisms by Platts, Higginbotham). Her modifications are as follows. First, it is suggested that the theory of action sentences and the paratactic proposal be combined — "said" is now a three place predicate with an extra place for an utterance event. This seems to be an acceptable interpretation for verbs of attitude as well, allowing them to acknowledge states. The samesaying analysis is redefined so as to make samesaying a relation between states/events (which may be utterances) and utterances, the connection between saying-that (indirect) and saying or uttering (direct) being expressed as follows:

Say-that(a,u,v) $\leftrightarrow$ Utter(a,u) & SAMESAY(u,v)

These ideas extend to the other propositional attitudes, the appropriate substitutions being made for belief states, fear states etc, so that we end up with, for example:

(11) $(\exists z)$(Fears(A,z,that)). It's raining.

The discussion of direct and indirect "says" leads Hornsby to conjecture that the two have been confused by McFetridge, and that it is this confusion which motivates his analysis (see above). Hornsby thinks that her view has certain advantages:

> On the present view there is room to suppose that it is Galileo's direct sayings whose number we should ask after if we were to enquire "How many things did Galileo say?". (Hornsby 1977: 178)

However, although Hornsby's suggestion addresses the problem which arises in McFetridge's sample dialogue — there were not two things said by Galileo, but two things samesay his utterance — it is not clear that her approach is as suitable for dealing with with the example given by Burge (i.e. inference of the form "p; so, p"). Taking up the suggestion put forward by Hornsby we get something like the following construal of Burge's example:

Utter(G,u) & SAMESAY(u,v); so,
Utter(G,u) & SAMESAY(u,w)

As it stands, this does not seem right; certain modifications will have to made to the original suggestion to allow us to retain the inference. In view of this, it would be advantageous to adopt McFetridge's proposal, which has the appropriate modifications built into it.

From our point of view, a more interesting feature of Hornsby's approach is that, in the relational senses of sentences attributing beliefs etc, the demonstrative "that" refers to an utterance of an open sentence. In the logical form of these sentences a predicate "Of" appears. For example, (12) goes over as (13).

(12) Ralph believes of someone that he is a spy.

(13) $(\exists u)(\exists y)$(Of(y,u) & Said(Ralph,u,that)). x is a spy.
(c.f. "Every boy says of himself that. He is wise.")

This move is supported by the view, expressed by Hornsby, Burge and others that we sometimes utter open sentences, and that certain occurrences of pronouns should be treated as free variables.

The introduction of the new predicate, "Of", turns out to be quite important. If Tim has a belief of the Queen, then it is via his belief state that he is related to the Queen. It is also supposed that "Of" is constantly a two-place predicate, the second place being reserved for n-tuples (designations of n-tuples are to be introduced as primitives). In view of this, (15) goes over as (16):

(15) Ralph says of Dick and Tom that the former spies on the latter.

(16) (∃u)(Of(<Dick,Tom>,u) & Said(Ralph,that)). x_1 spies on x_2.

Regarding the use of indexed variables, it is remarked "Speakers display their concept of an order, the theorist simply makes it manifest with the tools at his disposal" (p182).As Hornsby says, the introduction of n-tuples will mean a new "object-language" ontology. In Chapter Six, the device of n-tuples will be of use in the treatment of sentences attributing intentional and complex activity.

Although it is not acknowledged, Boer and Lycan run together ideas from both the modifications to Davidson's theory so far discussed (Boer and Lycan 1986), i.e. those due to McFetridge and Hornsby. First, they employ the notion that deferred ostension is really at work in the paratactic proposal:

> Instead of treating the demonstrative "that" (or its surrogate "my next utterance") as having direct reference to the displayed sentence, let us treat the displayed sentence as the vehicle of a *deferred* ostension: The displayed sentence serves merely as a *sample* of a kind or class of sentences which is the deferred referent of "that". (Boer and Lycan 1986: 51)

The predicate "said" receives, instead of the samesaying gloss, the paraphrase "assertively utters one of". The intuitive idea is that the utterer of "John says that Tom is a fool" asserts "John says that" while forcelessly tokening "Tom is a fool" as a sample of the kind of thing that John supposedly uttered, securing reference to that kind by means of deferred ostension. The advance over the previous proposal put forward by McFetridge is that the class of sentences to which the demonstrative refers is construed as the class of sentences playing the same linguistic role as the displayed sentence. The force of "John believes that" concatenated with the display of a sentence is to ascribe to John a believing-true of one of the role-sharing sentences. Alternatively, employing a version of Sellars' dot-quotes, Boer and Lycan suggest that "John believes that Tom is a fool" is true at an index if and only if John believes-true a •Tom is a fool• (where the dot-quotes apply to a linguistic expression resulting in a common noun whose extension includes the expression quoted plus any other expression that plays the same linguistic role).

More specifically, in explicating linguistic role, Boer and Lycan talk of the "M-role" of sample sentences, where M is the "salient" role kind. The roles which may be salient are the *truth-theoretic role* and the *conceptual role.* In the case of the former, sentences S and S' play the same role when S and S' have the same truth condition. In the case of the latter, we are concerned with the role that a sentence plays within a speaker's public language, "language game", or "behavioural economy": S plays for speaker x the same conceptual role that a sentence S' plays for a speaker y just in case x and y mobilise S and

S', respectively, in closely similar ways in both practical and theoretical reasoning (Boer and Lycan 1986: 52-53). Every deferred ostension is pragmatically ambiguous as regards how something must resemble its display sample, due to there being more than one possible role available. Contextual factors are involved in determining which role is salient. Boer and Lycan's proposal represents a more sophisticated version of the idea of "proposition by proxy" which was put forward by McFetridge, and as such has the potential to be modified and built upon. Although it is not part of present concerns to investigate thoroughly the idea of, for example, conceptual role, it should be clear that what has been said indicates that it is possible to ground out our idea of proposition in something more than the vague notion of "reporting". In fact, I would suggest that we are in no worse position than theorists who appeal to possible worlds to elucidate their idea of proposition.

The other idea which is put to use in Boer and Lycan's resulting analysis concerns the proposal that open sentences, or utterances of them, should in certain circumstances be the referents of the demonstrative "that". For example, (17) goes over as (18) in Boer and Lycan's notation:

(17) John believes of Tom that he is a fool.

(18) BELIEVE(John,<Tom>,$THAT_1$). $fool(x_1)$.

It is also stipulated that "believes" is really a three-place predicate, and that its notional form looks like (19)

(19) BELIEVE(John,< >,$THAT_1$).

where "< >" names the empty sequence. The two ideas that Boer and Lycan employ in their theory of logical forms will be useful in accommodating the class of sentences that ascribe intention and action.

The paratactic analysis is also discussed and then employed elsewhere by Lycan (Lycan 1984). In this instance it is invoked to deal with what has been described as "the Performadox", which in turn is found to infect the "performative analysis". According to the performative analysis, a sentence's underlying syntactic structure contains not only what would normally have been taken to be that sentence's logical form, but also a governing performative preface that represents the sentence's normal or intended illocutionary force. Furthermore, every sentence is supposed to be explicitly performative at the level of underlying representation of logical form, even apparently nonperformative

sentences. For example, (20) has the underlying structure (21).

(20) I state that I have never been a communist.

(21) STATE(I, you, I have never been a communist)

The performative analysis generates a paradox which may be summarised as follows — adapted from (Lycan 1984: 141):

1) If the Performative Analysis is correct, then every complete English sentence contains at the level of deep structure a governing performative verb.
2) If this performative verb is not semantically interpretable then the sentence is not interpretable.
3) If the performative verb is semantically interpretable, then the sentence is assigned the wrong truth condition.
4) Each of the consequences 2 and 3 is unacceptable.

Point 3) can be illustrated by ordinary declarative sentences: since every overt declarative is supposed to contain an underlying performative verb of stating, we should end up assigning the value True to any declarative sentence whatever on any occasion of its genuinely being used to make an assertion.

Lycan attempts to avoid this problem by abandoning the performative analysis in its full-blown form, and adopting a weakened version of it. This version eschews the claim that a declarative "semantic representation" contains "I", "STATE" and "you" occurring in a higher clause with their normal meanings, and incorporates the paratactic analysis. The Davidsonian manoeuvre is brought in to deal with those problematic constructions which do seem to require a "performative preface", e.g. (22) is paraphrased as (23).

(22) Confidentially, Tom is a fool.

(23) Tom is a fool. I state that confidentially.

It is proposed that the presence of adverbs like "confidentially" in (22) as well as reason-adverbials like "in case you haven't heard", both of which are referred to as "superficially anchorless adverbial modifiers" (p152), requires a paratactic analysis. It is also argued that another class of sentences, those containing overtly explicit performatives, also admit of a paratactic interpretation. However, other sentences like ordinary declaratives, it is claimed,

do not invoke the paratactic method; so Davidson's manoeuvre is confined to certain classes of sentences. This sort of proposal will be discussed in the next subsection.

1.4. Comments

We have seen that there are problems with Davidson's paratactic analysis In addition, it appears that, in this particular case, questions affecting the separation of analysis and logical form seem bound to arise. What is clear, whether or not the above problems can be accounted for, is that the paratactic proposal as he presents it is Davidson's only way of dealing with intensional contexts. This fact gives rise to a number of doubts. For example, we must decide whether this sort of proposal generalises to other intensional contexts — should an intensional context be defined in terms of its availability to parataxis? However, Higginbotham may be right in saying that obvious uses of "that" as a complementiser cannot be rendered by construing "that" as a demonstrative. These sorts of questions will be addressed in Chapters Four and Six dealing with the treatment of sentences reporting complex and purposeful action, when we shall have to decide finally whether or not to adopt the sort of position advocated by Davidson.

As well as giving us reason to doubt the proposal, our treatment of its difficulties has given rise to some positive suggestions. If we adopt something like Boer and Lycan's modification of McFetridge's notion of propositions, we can provide an account which is missing from other versions of the same approach. This account seems general enough to suit our purposes, and we shall assume in further discussion which mentions propositions that this is a candidate for the notion of proposition to be employed, i.e. on occasion, we could say that we are providing a representative (display sample) logical form for a role-related class of sentences. In addition, the idea that open sentences are available for the representation of natural language phenomena will also be of use to our project of providing an account of a certain class of adverbs which has not before received a satisfactory treatment.

Regarding this last point, we saw that Lycan has made a suggestion regarding the treatment of adverbs like "confidentially". I would now like to point out that, by our lights, Lycan's approach seems unsatisfactory. In other words

Tom is a fool. I state that confidentially.

is the wrong way of accommodating the adverb. My comments are fuelled by observations made by Davidson regarding the treatment of intentional adverbs (Davidson 1967a).

Although it may be disputed whether "confidentially" is an intentional adverb, it seems to me to connote an attitude on behalf of the speaker towards something. One reason for it not being an intentional adverb is that it does not seem to be tied to the agent in the same way that, for example, "intentionally" is; using classification proposed by Jackendoff (Jackendoff 1972), we could say that "confidentially", as it appears in the example sentence, is a speaker-oriented adverb, similar in its behaviour to "happily" (one sense, at least) and "truthfully". Whatever class of adverbs we assign it to, it must be conceded that saying something in confidence amounts to passing a judgement on an utterance. In this sense Davidson's comments on intentional adverbs are apposite. He points out that the adverbial form of "intentionally" must be in some way deceptive: doing something intentionally is not a manner of doing it. To say someone did something intentionally is to describe that action as perhaps having been caused in a certain way by beliefs and attitudes — but this does not mean that the agent is described as performing any further action.

These points gain purchase on Lycan's proposal. The idea that adverbs like "confidentially" are different from others is taken up by him, but not the important notion that, in his example, to say something confidentially (preface it with the adverb) is not a manner of saying it. It expresses an attitude towards, or a judgement upon, an utterance. Lycan's paraphrase means that an additional verb of stating is introduced which is modified by "confidentially" construed as a manner adverb. What is needed, perhaps, is an analysis which conforms to a paraphrase like "It is confidential that Tom is a fool", the relevant parataxis being something like:

Tom is a fool. That is confidential.

As it stands, Lycan's analysis is analogous to representing the intentional adverb in "Tom coughed deliberately" in terms of the manner in which the action was performed. The correct paraphrase would be something like "Tom coughed. That was deliberate of Tom".

2. Demonstrative Constructions

We have seen some advantages and disadvantages of a paratactic proposal which relies on there being a demonstrative "that" present in logical form. Whatever we think of the proposal, there remains the question of how demonstratives or indexicals are to be treated in a theory such as the one that we are advocating. It is to this related topic that we now turn.

This section concerns the treatment of indexicals within a broadly Davidsonian framework. It will not be possible to do justice to the amount of work that there has been

on this subject but it is hoped that the contributions discussed here will be of particular relevance to the concerns of the present project.

2.1. Different approaches

As Burge remarks, Davidson does not really elaborate a theory of demonstratives (Burge 1974). These examples of T-sentences for sentences of English containing demonstratives are given in "Truth and Meaning" (Davidson 1967b):

(24) "I am tired" is true as potentially spoken by p at t if and only if p is tired at t.

(25) "That book was stolen" is true as potentially spoken by p at t if and only if the book demonstrated by p at t is stolen prior to t.

In the course of evaluating other approaches to demonstratives, it will become evident that (24) and (25) are not satisfactory analyses. The first approach to be considered is Weinstein's (Weinstein 1974).

Weinstein's account, which is intended to cover demonstrative pronouns such as "this" and "that" has been labelled a "conditional assignment" method. This means that the truth condition assigned to a sentence, i.e. the T-sentence, is conditional upon the satisfaction of certain antecedent clauses. More precisely, according to Weinstein, the T-sentence for a particular *utterance* is conditional in form. This is generated by an axiom which may be paraphrased as follows — after Lycan (Lycan 1984):

> If u is an utterance of S, and x is the sequence of objects respectively picked out in the context by the demonstratives contained in S in the order in which they occur, then S is TRUE $\leftrightarrow$ x satisfies the result of replacing the demonstratives in S with matching variables.

It is claimed that one of the advantages of this theory over the naive account offered by Davidson is that "demonstrated by" does not appear on the right hand side of the biconditional, and the technical term "picks out" occurs in "an apparently harmless prologue and not in the truth condition" (Lycan 1984: 302). For all the advantages of the proposal, it stops short of generalising to other indexical features of natural language. It is also rather too sketchy as it stands to allow us to see its potential as a theory of demonstratives. Burge offers a related and more detailed proposal (Burge 1974).

Burge also uses the notion of the conditional assignment of truth conditions to deal with sentences containing demonstrative constructions. In order to motivate this analysis, criticisms are made of Davidson's original suggestions, e.g. (24) and (25). If we let "Reagan*" be a unique specification of Ronald Reagan, then the truth conditions assigned to specified utterances of "Reagan* is tired" and "I am tired" (uttered by Reagan at the relevant time) would be the same. However, a satisfactory semantic theory of demonstratives should show how these two utterances differ semantically while retaining the correct entailment relation between them. Moreover, the analyses represented by (24) and (25) do not show that there is any common element of demonstratives and other indexical expressions.

The antecedent clauses of Burge's conditional assignment of truth conditions can be illustrated with the sentence "That is a dog".

(26) $(\exists x)$[Reference(x) & By(x,p) & To(x,y) & At(x,now) & With(x,"$that_9$","That is a dog")]

This receives the paraphrase "p refers to y with "that" in "That is a dog"". Note that the word "that" is subscripted to mark a particular occurrence. Also important is that in using "refers" Burge has in mind "an action on the part of a person — not a relation between word and object" (p209). Therefore the expression "Reference(x)" associated with an act of reference sits quite nicely with Davidson's view of the importance of acknowledging actions when doing semantics. Note that here reference is a form of intentional behaviour rather than a semantical relation such as denotation or satisfaction. We may now paraphrase the full conditional for the target sentence: For any x and y, if x is an act of reference by p to y at t with "$that_9$" (a particular occurrence) in "That is a dog", then "That is a dog" is TRUE with respect to p and t $\leftrightarrow$ the object which is y is a dog. This goes over as

(27) (x)(y)[Reference(x) & By(x,p) & At(x,t) & With(x,"$that_9$","That is a dog") & To(x,y) $\rightarrow$ ("That is a dog" is TRUE with respect to p and t $\leftrightarrow$ Dog([y]))]

One important thing to notice about this proposal is that it claims that, although utterances of sentences containing demonstratives are to be construed as utterances of open formulae, sentences containing a demonstrative element are on some occasions not just true or false of objects, but are *true* or *false*. That this is an unusual claim is clear if we consider the definition of truth along Tarskian lines and observe that the truth predicate attaches to closed sentences, open sentences only being satisfied by certain sequences. To see how

Burge's idea works we need to look at the expression, "Dog([y])". The formation rules of the truth theory are to include open singular terms of the form

(28) $[x_i]P(x_1..,x_i..,x_n)$

where the bracketed variable is free and represents the demonstrative that governs the whole scope of the term. (28) is equivalent to (29), where "ι" is the definite description operator.

(29) $(\iota z)(P(x_1..,z..,x_n) \ \& \ z=x_i)$

Note that in (28) and (29) x_i is free and may be quantified from outside the term — in (27) the term "[y]" is equivalent to "(ιz)(z=y)", and the quantifier binds the variable as it occurs in the antecedent and as it occurs in the consequent. Since, as Burge claims, sentences containing demonstratives are neither true nor false apart from actual use, formal representations of sentences involving demonstratives are open sentences: "The object-language user completes the semantical interpretation of such open sentences extralinguistically — via his act(s) of reference" (p212). Presumably, Burge will need an axiom to do the work of Weinstein's axiom which has been paraphrased above, in order to be able to assign the truth predicate to sentences containing demonstratives. We may expect Burge to handle other deictic elements by adding distinctive special clauses to the antecedents of his conditionalised T-sentences. For example, Burge handles proper names in a way which fits in with the rest of his theory of demonstratives, e.g. "[y]Cicero(y)". The accommodation of demonstratives using free variables in the representation of utterances of open sentences is similar in its motivation to Hornsby's use of the same device, which was discussed earlier. There are two principal reactions to the conditional assignment approach which will be considered. The first of these is due to Barry Taylor (Taylor 1980).

Taylor rejects the conditional assignment method and opts instead for the "method of scope distinction", which will be discussed in a moment. The metalanguage is equipped with a "pragmatic predicate", "$Dem_i(u,t,x)$", which is given the interpretation:

"x is an object demonstrated by u in his i^{th} utterance of "that" during t" (p185)

It is also proposed that the truth predicate be relativised to utterers, times, and "points of reference". The latter are finite sequences interpreted as semantically relevant features of possible contexts in which demonstrative sentences might be evaluated. In terms of utterers

and times the elements of an associated point of reference can be specified by invoking the pragmatic notion of speaker demonstration. Taylor claims that the relativisation of the truth predicate is an alternative to the predication of truth to utterances (Weinstein); however, it seems to me that predicating truth of utterances and relativising it in the way Taylor proposes amount to the same thing.

The truth theory as it is first presented (Taylor 1980:187) will deliver theorems like (30), where r ranges over points of reference, the subscript indicating the element of r:

(30) True("Red(that)",u,t,r) $\leftrightarrow$ $Dem_1(u,t,r_1)$ & $Red(r_1)$.
[i.e. equivalently
True("Red(that)",u,t,r) $\leftrightarrow$ $(\exists x)(x=r_1$ & $Dem_1(u,t,x)$ & $Red(x))$.]

However, according to Taylor, this yields counterintuitive results for negation: "that is not red" counts as true if either u demonstrates nothing during t, or, while demonstrating something, fails to make a demonstration of r_1. Note that this problem would not arise with the conditional assignment approach. That method would face no difficulties about assigning the wrong truth conditions to sentences at indices that fail to be appropriately related — for when the appropriate relation fails to hold, no truth condition will be assigned at all. It is the problem associated with negation which leads to Taylor's adoption of the "scope distinction" approach. This approach allows that "That is red" can have both internal and external negation, and treats "that" as a unary quantifier instead of a constant. External negation of the sentence allows it to count as true when $\sim Dem_1(u,t,r_1)$; the internal negation of the sentence qualifies as true when $Dem_1(u,t,r_1)$ but r_1 is not red. External and internal negations of our example are represented as (31) and (32), which receive the truth conditions (33) and (34) respectively:

(31) $\sim$(thatx)Red(x)

(32) (thatx)$\sim$Red(x)

(33) $\sim(Dem_1(u,t,r_1)$ & $Red(r_1))$

(34) $Dem_1(u,t,r_1)$ & $\sim Red(r_1)$

There are problems with the approach advocated by Taylor and the motivation from the negation problem; these will be returned to in the next subsection.

Taylor claims that the idea of treating the demonstrative pronoun as a quantifier generalises to cases of *complex* demonstratives more readily than the conditional assignment approach. A complex demonstrative takes the form "That F is G". The proposal of unary quantification which worked for simple demonstratives seems inappropriate for complex ones since representations of the form

(thatx)(Fx & Gx)

fail to capture the asymmetry of sentences like "that dog is old". In order to account for this phenomenon it is suggested that the complex demonstrative be construed as a binary quantifier so that "that F is G" goes over as

(35) (thatx)(Fx;Gx)

An example is given to show that the conditional account cannot cope with complex demonstratives and that the binary and unary account of "that" quantification admit of a uniform treatment. We shall return to this shortly.

The final treatment of demonstratives which is both "Davidsonian" and a reaction to the conditional approach comes from Lycan (Lycan 1984). The idea here is to provide a uniform treatment of all indexical expressions, not just demonstrative pronouns, by relativising the truth predicate to a context, C. An assignment function, "a", is also defined. Initially, it is taken to be a composite function which conforms to the "two-stage model":

i. f: English words → flagged free variables.
ii. f': Flagged free variables → denotata.

However, since the metatheory is primarily concerned with semantic representations, "a" is identified with f' only. The "truth theorems" which are generated by the theory may be illustrated with (36).

(36) "I am tired now" is True in C ↔ a("I",C) is tired at a("now",C).

Note that the reason why (36) is called a "truth *theorem*" is because it is not a T-sentence, even though it is provable in the theory; "semantic ascent" means that the right hand side is not logically equivalent to the target sentence. The theorem will *yield* the T-sentence as soon as the pragmatics feeds it the context-bound premisses of the form "a("I",C) = x" and "a("now",C) = t", i.e. the pragmatics contains a number of valuation rules. The explicit

invocation of the pragmatic component, or, rather, the sharp distinction drawn between pragmatics and semantics is brought on by criticism of the conditional approach adopted by Burge. It is claimed by Lycan that facts like "I" always refers to the speaker should not be incorporated into the semantics and appear in special clauses as would happen on the conditional assignment account. Rather, knowledge of these facts is knowledge of pragmatics not semantics. Semantics should not attempt to explain its own primitives like denotation and satisfaction, and "we should expunge anthropological notions like "referring to y with" from truth definitions and thereby streamline our truth theory".

2.2 The conditional assignment approach

In later chapters, we shall be employing the apparatus of conditional assignment in the representation of our chosen expressions. What follows are a number of considerations to be taken into account in the course of endorsing the conditional assignment approach, rather than approaches due to Taylor or Lycan.

It is clear that the conditional assignment method has advantages over the original proposal for demonstratives given in Davidson's "Truth and Meaning" (Davidson 1967b), where the appearance of the demonstration predicate on the right hand side of T-sentences proved troublesome as did the nonuniform treatment of indexical expressions. By Burge's lights, Taylor's theory is a step backwards since the "pragmatic predicate" associated with speaker demonstration is allowed to appear on the right hand side, and it is not clear that the method either generalises or is supposed to generalise to other indexical expressions. Taylor's proposal can be divided into a positive and a negative part: the former is the suggestion that we regard demonstratives as quantifiers, while the negative thesis attempts to show that the conditional assignment method cannot deal with a certain sort of complex demonstrative. The latter will be discussed first.

It is claimed that the conditional assignment method works well enough for sentences like "That man is tall", yielding, according to Taylor, the following (where "$Dem_i(u,t,x,s)$" is read "x is an item demonstrated as a member of s by u in his ith utterance of the demonstrative quantifier during t", and demonstratives form singular terms rather like the description operator):

(37) $Dem_1(u,t,r_1,\{x|Man(x)\}). \rightarrow .TRUE("Tall(that\ x\ Man(x))",u,t,r) \leftrightarrow Tall(r_1).$

Here, the demonstrative is like the description operator and forms singular terms. However, the method is not supposed to work for sentences like "There is someone who loathes that denigrator of his", which involve quantification into descriptions embedded inside complex demonstratives. Suppose A is the wff

$(\exists y)Loathe(y,that\ x\ Denigrate(x,y))$

then (38) is not a satisfactory consequence

(38) $Dem_1(u,t,r_1,\{x|Denigrate(x,y)\}).\ \rightarrow .TRUE(A,u,t,r) \leftrightarrow (\exists y)Loathe(y,r_1)$.

since the variable, y, in the set abstract is not bound by the succeeding quantifier.
Taylor claims that the situation is no better in the case of implicit quantification in prenex position. The consequence

$Dem_1(u,t,r_1,\{x|Denigrate(x,y)\}).$—>$.TRUE(A,u,t,r)$ <—> $Loathe(y,r_1)$

leads to incompatible truth-values being assigned to A if we suppose that u simultaneously demonstrates r_1 as a member of the set of y_1's denigrators and of y_2's denigrators where y_1 loathes r_1 but y_2 does not.

In view of the above objection, a Burge-style assignment of truth-conditions seems to be only a qualified success. However, it may be possible to buttress our favoured method of coping with demonstratives by appealing to an argument put forward by Martin Davies in support of the conditional assignment approach (Davies 1982). First Davies claims that Taylor's scope-distinction method, in its employment of the reference predicate, fails to acknowledge that the concept of reference (like the concept of individuation under a concept) does not actually enter the content of an assertion; there is nothing in the assertoric content of such utterances which would allow for two interactions with negation. He goes on to argue that, according to his own account, sentences which involve quantification into complex demonstratives (e.g. "Someone loathes that denigrator of his.") are semantically incoherent. Davies claims that quantification into the "matrix" of a complex demonstrative (e.g. "denigrator of John's") can only be seen as semantically coherent if an account is adopted according to which the appearance of such quantification in surface form is massively misleading as to the form assigned sentences at the level of input to the truth theory. Davies rejects such an account. (Davies' own view is that the matrix has an individuative role which is logically prior to the assignment of truth conditions.) That Taylor's theory can handle such dubious sentences cannot now be a reason for abandoning the conditional assignment approach favoured by Davies. Finally, Davies supports his claims with empirical facts about language users' reactions to the controversial sentences. I advance Davies' account as a consideration which favours conditional assignment, rather than as a knock-down argument. No doubt, more work needs to be done in order to turn Burge's approach into one which permits unqualified endorsement.

Given Taylor's theory, we may say that it is unclear whether we are to regard all indexical expressions as quantifiers; it is not obvious that indexicals like "I" behave in this way. It is also necessary to accommodate the two interpretations of "that" as a unary and binary quantifier; but it is not clear that the demonstrative pronoun really can be said to have two meanings. The motivation for using the quantifier interpretation was difficulty with negation. But this was a consequence of the analysis proposed by Taylor which retained the pragmatic demonstrative predicate on the right hand side of the T-sentence. As Taylor concedes, there is no problem with negation if we adopt the alternative method of assigning truth conditions along lines suggested by Burge. It is not at all clear that the resulting internal/external negation ambiguity which results from the quantifier

interpretation of "that" is present in the "surface structure" of English sentences. Instead, the problem could simply be an unwelcome result of adopting Taylor's account.

The other reaction to the method of conditional assignment comes from Lycan, who accuses it of being cumbersome, and, as noted above, not respecting the distinction between semantics and pragmatics. The first of these objections, which seems to be an aesthetic point, can be dealt with quickly. Lycan's own theory could be accused of being cumbersome, as could many other proposals regarding the interpretation of English sentences, if we are concerned with how much space is taken up on the page. What is important is that the proposal manifest theoretical elegance with respect to the resources it employs. The conditional assignment approach which is favoured here respects this principle.

The claim about semantics and pragmatics deserves further comment. It is difficult to know what is to count as semantic and what is to count as pragmatic knowledge. In the face of example sentences the boundary between the two tends to blur — especially when considering the class of sentences containing indexical elements. There seems to be little problem in including "anthropological notions like "referring to y with"" in the conditional statement of truth conditions — problems only arise when this sort of expression appears on the right hand side of the biconditional T-sentence. Lycan is no doubt correct when he says that semantics should not try to explain its own primitives (p53), but, in giving the conditions for the T-sentence, no attempt is being made to explicate notions like satisfaction and denotation [1]. Nor is it clear that Burge's antecedent does introduce any anthropological notions: e.g. "With" represents a relation between actions (acts of reference), demonstratives and sentences (or utterances). The invocation of actions is in accord with the acknowledgement of actions and events in the semantical enterprise — i.e. it fits in well with the other main component of the project.

In addition, Lycan's proposal is not without its own difficulties concerning the question of pragmatics. The function, a, which takes as its arguments appropriately flagged free variables and a "context", commits us to explicit acknowledgement of "contexts". As remarked above, the conditional assignment approach simply requires quantification over actions. Furthermore, the truth theory will not generate T-sentences, only "truth theorems". It is left to a pragmatic component to provide the truth conditions for target sentences. Both Lycan's approach and the conditional assignment approach capture the idea that the utterance of a sentence containing a demonstrative expression produced in a particular circumstances can be true "tout court". However, Lycan's method does so at the cost of explicitly acknowledging whole "contexts", and by invoking an unspecified pragmatic

[1] In the first chapter it was suggested that these and related notions, like reference, are not explained by the Davidsonian approach.

component which is needed because the semantic component does not assign truth conditions to target sentences.

2.3 Comments

As a result of considerations put forward in the preceding section, it is possible to identify Burge's theory of conditional assignment as a credible account of the treatment of demonstrative constructions in a broadly Davidsonian framework. Its generality and the way it has been taken up by others working in areas related to ours mean that it is well-suited to our purposes. We shall employ it in the representations of Chapter Six.

Conclusion

In the first half of this chapter, the standard paratactic manoeuvre was cast into doubt as a method of dealing with intensional contexts created by verbs of attitude. In addition, it was seen that the problems which infect the paratactic analysis bring questions of logical form and predicate analysis close together. The result of this was that some notion of proposition had to be mooted. In Chapter Four, the question will be considered of whether it is really appropriate to use a version of the paratactic method in the representation of an important adverbial attributing complex action.

The second half of the chapter concentrated on ways of representing demonstrative constructions within a Davidsonian framework. It was concluded that the conditional assignment method is the most suitable. In Chapter Six this method will be of assistance in the representation of target expressions which have an indexical element.

Together with Chapter Two, this chapter has evaluated techniques of representation within the Davidsonian Programme. The following two chapters will explore theoretical issues of human action. Chapter Four will show what complications arise for a theory of action rather than a theory of events, and, in so doing, will isolate an important feature of human action which must be accommodated by any theory. The feature is sometimes called (misleadingly, as it turns out) the "by"-relation, and is involved in attributions of complex action. Event theories, which first arose in Chapter Two, will be briefly reconsidered in the light of the way in which they affect the logical forms of action sentences. In addition, another theory of adverbial modification will be discussed.

CHAPTER 4

Human Action and the By-Locution

Introduction

This chapter is concerned with the characterisation of human action and the isolation, and subsequent treatment of an adverbial construction which is central to the accommodation of reports of complex activity. In the course of this, another, decompositional theory of adverbial modification is examined. The construction to be dealt with is the "by"-locution (sometimes referred to as the "by"-relation) and has the characteristic form, "A x-ed by y-ing". A number of alternatives are presented for representing "by". One involves abandoning the unifier approach to actions, while another retains this thesis but employs a decompositional theory. Their evaluation leads to a proposal along Davidsonian lines which adheres to a unifier theory of action and does not employ decomposition. This resulting recommendation is motivated by the idea that an action is capable of falling under a descriptions and that the "by"-locution is an articulation of this theoretical perspective.

The chapter is divided into three main sections. The first is a discussion of actions and theories of human action. The second contains an assessment of a decompositional theory of adverbial modification. The final section draws upon observations made in the preceding two and explores ways of representing the "by"-locution, a construction which is central to the treatment of reports of complex action.

1. Actions

We saw earlier that there are a number of different positions which can be taken regarding the nature of events. A number of conclusions were drawn following metaphysical speculation. In what follows, we shall conduct an examination of the nature of action, this time taking a more semantical perspective.

It is possible to identify a number of different types of action theory which have been popular at one time or another. The majority of action theories have assumed, like us, that actions constitute a species of event. Actions, as well as events, take part in causal relationships.

Tuomela believes that, in addition to taking part in causal relationships, we have reason to think actions are a species of event because of the way in which both are explained (Tuomela 1977). Many of the theories of action which have been advocated in the past seek to give some account of the way in which action seems to involve some sort of inner state or episode such as a desire. Those which have been labelled Davidsonian invoke the combination of a belief and a desire. Since the present treatment of action and action sentences inclines to the semantical, it will constrain its consideration of questions pertaining to "inner episodes" by focussing on the way in which such questions affect our attempts to uncover the conceptual resources harboured in sentences of natural language.

Approaches to the philosophy of action can be differentiated by their approach to the question of what an action is — I take my lead from Brand (Brand 1984). For example, the "Volitional", "Mental Action" and "Causal" theories of action are formulated as follows (where A ranges over event types, B ranges over types of behaviours, M and M' stand for mental actions and non-actional mental events respectively):

> Volitional theory: S's A-ing is an action iff there is a M' of S such that i) M'caused S's B-ing, ii) M' is appropriate to S's A-ing, and iii) S's B-ing is associated with S's A-ing.
> Mental action theory: S's A-ing is an action iff there is a M of S such that i) M caused S's B-ing and ii) S's B-ing is associated with S's A-ing.
> Causal theory: S's A-ing is an action iff there is a M' of S such that i) M' caused S's A-ing and ii) M' is appropriate to S's A-ing.

Brand claims that J.J. Thomson argues for something like the Volitional theory (Thomson 1977), whereas Hornsby supports a version of the mental action theory (Hornsby 1980a). The action, in the latter case, is an event of "trying" or attempting to act. Possibly the most commonly held theory of action is the "Causal Theory". This sort of theory has been held by Davidson, Goldman, Castaneda and others. As I remarked above, the present concern is with providing an action theory which contributes to our semantic project. Indeed, certain proposals regarding actions will be thrown up as a result of doing semantics. I would suggest that proposals which result from subsequent discussion of logical forms and related topics would be in harmony with something like the Davidsonian theory of action as mentioned above. What is important to us, however, as will become evident, is that we consider actions to be bodily movements, and that these actions can fall under a number of different descriptions. Furthermore, an action is "intentional" under one at least one of these descriptions. So we can say that, for an event to be an action, it should be a bodily movement (broadly interpreted) which is intentional under at least one description. This will not count as actions cases of part of an agent's body being moved by someone else. The idea that actions are bodily movements is in line with Davidson's proposals, and seems to fit in well with the reductive unifier theory of events supported

earlier. This is perhaps more evident if we consider that the interpretation of examples which seem to motivate the multiplier analysis is, by our lights, a case of one action falling under more than one description: a movement can be interpreted in a variety of ways.

Taking an action to be a bodily movement may, in certain circumstances, portray a situation in an unusual way, but this does not amount to saying something false. I have in mind an example used by J.J. Thomson in which Smith shoots Jones, who dies some time later (Thomson 1971). The question that is supposed to arise concerns the relationship between the killing, the shooting and the dying. The view that we have taken says that the shooting and the killing were the same movement, and that that movement preceded the death of Jones.

Having said that we consider actions to be a special subset of events, the question remains of whether a distinction between actions and events makes any material difference to us. I should like to answer in the affirmative, and further suggest that an appreciation of this difference is what will provide us with insights about how to treat the sort of reports which we are interested in — namely, reports of complex and intentional action. In fact, consideration of the way in which action and event language differs will lead directly to an important phenomenon which any account of action sentences should be able to accommodate.

During the discussion of events and adverbial modification, a theory, due to Lemmon and Bennett, was considered which we classified as a structuralist-unifier theory. This has the unwelcome result of always identifying events and actions which allegedly had the same spatio-temporal location. Suppose John works hard and at the same time learns French. This situation is to be distinguished from his learning French *by* working hard. The Bennett-Lemmon suggestion does not make the distinction between related and unrelated actions. (An associated difficulty with that approach, when it is combined with a Davidsonian account of adverbs, is that, in the preceding example, if John works adverbly, then he learns French adverbly.) It is important to notice that it is actions, agent-events, or events that contain an ingredient of agency, which are involved in whatever it is that "by" expresses. In fact, I would like to suggest that, just as it is part of the nature of events in general to be involved in the causal nexus, it is part of the nature of actions in particular that they participate in the "by"-relation. Davidson, who labels the "by" phenomenon the "accordion effect", makes a similar claim when he says that the accordion effect is limited to agents and that we may take it to be a mark of agency (Davidson 1971: 54).

Many theories of action spend a considerable amount of time exploiting the idea of doing one thing by doing another in order to account for certain characteristics of human action. For example, many writers feel that a theory of action is unsatisfactory unless it says something about the nature of "basic action". This idea is derived from the intuition

that some actions may be more primitive than others, and that, in any activity, there is one action which is more basic than any of the others. According to the Davidsonian theory of action, all actions will be basic under one description. We could say that a basic action is one which is not done by doing anything else. Since the introduction of agency to events does seem to be accompanied by a special characteristic, it would be as well to explore the sort of idea which is expressed when we say sentences of the form "x f-ed by g-ing", with a view to accommodating reports of such complex activity (which involve an apparent multiplicity of actions) within our framework.

The relationship cropped up implicitly in our earlier classification of event theories. When classifying events with respect to the unifier-multiplier axis, the test we used to determine whether a particular theory came out as a multiplier or a unifier involved using the theory to answer questions of this form: How many actions are performed in "x f-ed by g-ing"? Metaphysical speculation and intuition seems to dictate that in many situations only one has been performed; however, in our following exploration of "by" we shall reconsider whether it is possible or plausible to maintain a unifier theory of events, or whether, in the end, we shall be forced to add a multiplier theory to our analysis. In other words, it will have to be decided whether a closer examination and a proper appreciation of the contribution which "by" makes to action reports and to our view of action will force us to change our theoretical perspective (after all, "by" might seem to fit more easily into a multiplier theory). So one issue which will occupy us will be whether a consideration of the way in which the putative "by"-relation is to be represented will force us to give up our ideas about the identity of actions. It will become clear that, if we are to retain a theory of actions and events which is in accord with a unifier theory, the idea of an action falling under a number of descriptions must be taken more seriously than it has been in Davidson's work on this topic. In fact, it must be central to an account of action sentences and adverbial modification, since the job of adverbs — by any account, but especially by one which so frequently identifies actions — is to provide more information about, or redescribe, an action. In addition to an acknowledgement of ideas discussed in Chapter Two, the final accommodation of "by" will confirm doubts expressed in Chapter Three regarding parataxis.

Before moving on to our exploration of the "by" locution, it will be necessary to consider a further account of the semantics of modification, which might be employed as a method of representing "by". This done, we shall be in possession of the resources required to begin our examination.

2. Another approach to modification

The semantic theory which is to be discussed here is known by the label "Decomposition". For the moment, we shall be specifically concerned with the work of Katz (Katz, Leacock and Ravin 1985, Katz 1987), although this particular approach can be seen as representative of a family of similar theories.

Katz gives a simple and useful description of the leading characteristic of decompositional theories:

> The special character of a decompositional theory is that it bases its account of compositional meaning on the structure revealed in analyses of the senses of syntactic simples. (Katz, Leacock and Ravin 1985:207)

One of the reasons why Katz is so confident about his theoretical approach, as characterised by the above remark, is that he believes that meaning is a perfectly legitimate notion to have around as long as we are sensible about it. Not only that, but, he seems to claim, meaning is an intuitive notion which will be properly articulated as a result of pursuing (Katz's) semantic theory all the way. All we have to do is take meanings or senses, as they present themselves in our ordinary linguistic experience, to be the proper objects of study in semantics.

Remarks made in the first chapter should make it clear that our own view of meaning does not accord with Katz's (according to Katz, meaning is meaning and nothing else (Katz 1987: 162)). I do not say that meaning is a difficult notion to get hold of — that would presuppose that meaning can be identified in the end. I suggest that, since meaning seems to be all things to all men (there is no common-sense notion of meaning), we should not put forward yet another proposal concerning the nature of meaning — what meaning really is, with nothing left out. Instead, we, pursuing a Davidsonian line in our characterisation of language, should replace any intended theory of meaning with a theory of truth [1]. The advantages of such a move have already been discussed along with the conception of uncovering the behaviour of expressions in logical form.

As we have seen, Katz thinks of decompositional theory as splitting up predicates (syntactic simples) into semantic components. In this sense they differ from non-decompositional theories, in which predicate constants correspond directly to the syntactic simples of a language. We shall use this loose definition in the following section to cover proposals which Katz may not think of as having a great deal in common with his own. In that section further criticism will be made of the decompositional approach, and it will be seen that one of Davidson's own proposals can be challenged.

---

[1] In connection with this, we could agree with one of Katz's remarks: he says that "reductive" theories, which replace the notion of meaning with something else, may be marvellous theories, but they are theories of something other than meaning.

Katz's own method of decomposition involves the use of "semantic markers", which mark the semantic structure of senses in the manner in which phrase markers mark the phrase structure of syntactic constructions. From such trees we can see, for example, that the verb "chase" involves dependencies between "catching", "movement" and "direction". It is thought the decompositional approach is particularly well-suited to dealing with the phenomenon of modification. For example, it is claimed that, unlike non-decompositional theories, Katz's theory can properly distinguish between the following sentences because it makes use of the alleged semantic components of "syntactic simples":

The nurse injected the medicine painstakingly.

and

The nurse injected the medicine painlessly.

Our proposals regarding adverbs of intention should take account of examples like these. It should also become clear, in the course of speculating about logical forms for our target class of expressions, that other of Katz's criticisms can be answered: for example, the question of whether different logical forms should be assigned to verbs that contain decompositional intensionality and synonymous verbs and intentional adverbs. On questions surrounding the representation of meaning-relations like synonymy, it is possible to anticipate the sort of answer that Davidsonian theory would provide. Questions of "meaning" (Katz's putative common-sense sense notion) are left untouched by a theory of logical form — it is not as ambitious a theory as Katz would like. Its modest claims result in the "meaning-relations" of words or predicates being left where they are — "the mystery is transferred from the word... in the object language to its translation in the metalanguage" (Davidson 1984: 31).

This section has shown how decompositional theory compares with broadly Davidsonian theory. In the next section, decomposition will be further examined and evaluated, in order to see whether it is required for the accommodation of a particular construction. A theory of events which was criticised earlier will also be reintroduced to determine whether we should, in the end, accept that theory in favour of our "philosophically" more acceptable one.

3. Exploration of the By-relation

In view of the above discussion, the question that will concern us for this section will be what interpretation we should put on the "by"-relation (and what implications this will have), or what it means to say that someone performed one action by performing another in sentences like

Smith killed Brown by stabbing him.
He crossed the channel by swimming it.

This question has been dealt with in one form or another by, for example, Hornsby and Goldman, but we will be putting forward a different proposal.

Before considering some potential ways of answering the question, we can eliminate one possible candidate from the enquiry. It might be thought that sentences of the form "(s)he f-d by g-ing" can be characterised by construing "by" as a sort of sentential connective, which could be added to our logical vocabulary. However, it must be conceded that if "by" does represent a sentential connective, then it must have the following two properties which distinguish it from the other connectives: it is not truth-functional, yet it permits substitution of some coreferring singular terms (specifying the agent). If we are to go along with Davidson, then the idea that "by" is a sentential connective looks as if it will fall prey to the "Frege argument" in the same way that a similar proposal concerning the causal relation did in "Causal Relations" (Davidson 1967c).

It would be as well to nip in the bud another attractive but unworkable idea. In talking about basic actions, Danto confused whatever "by" is used to express with the causal relation. Clearly, I may kill Brown by shooting him, but my shooting Brown does not cause my killing him (notice that we would be prepared to accept that my shooting Brown caused his death — but this looks like a relation between an action and a "bare" event). Although the phenomenon cannot simply be assimilated directly to causation, it has been suggested that there can be a more subtle relationship between the two. This will be discussed in due course.

In considering the treatment of sentences which say that someone performed one action by performing another, it will be suggested that the phrase that is formed from "by" (i.e. "by doing such-and-such") is an adverb. To be sure, it has features in common with other, more easily recognizable, adverbs, such as "quickly". For example, if the action of A-ing is identical with the action of B-ing, we cannot infer A-ing quickly is B-ing quickly. Nor can we say, under the same circumstances of identity, that A-ing by C-ing is B-ing by C-ing. Such similarities mean that the treatment of "by"-phrases will be part of a more general theory of adverbial modification. In focussing on this particular expression, we are,

in a sense, taking the unusual step of using it as a starting point for a treatment of adverbial modification.

The following subsection contains a discussion of the "by"-relation and its relationship to a theory of action which may be classified as structuralist-multiplier, i.e. opposite to the theory of events supported in Chapter Two according to the classification that was proposed there. Considerations of representation will confirm doubts that arose when looking at the "metaphysics" of events.

3.1. A relation between two actions

It is widely held that "by" expresses a relation between action-events, which is asymmetric and irreflexive. If this is the case, then it will be necessary to modify Davidson's theory of events and actions if we are to reconcile this claim with the account of the logical form of action sentences, an account which we may wish to retain for reasons associated with the way in which inferences and adverbial modification are accommodated. To anticipate, we may have to abandon a Davidsonian theory of events in favour of something like a multiplier theory, in spite of "metaphysical" reservations expressed earlier. The most obvious route to take is to deny that actions like crossing the channel and swimming it, or moving one's hand and frightening a fly (i.e. those actions which involve doing one by doing another) are ever identical. This would allow us to regiment such sentences in the following way. For "Smith turned on the light by flipping the switch" we could write (expressing "by" as an event relation)

(1) $(\exists e_1)(\exists e_2)[\text{turn-on}(S,l,e_1) \ \& \ \text{flip}(S,s,e_2) \ \& \ \text{by}(e_1,e_2)]$

Now sentences of the form "he f-d by g-ing" acknowledge the existence of two distinct events or actions. The question remains, having abandoned Davidson's theory of events, of what the replacement theory will look like which allows us to distinguish between a shooting and a killing, where I killed someone by shooting him.

In claiming that actions under consideration are in some sense distinct, it seems to be necessary, in order to satisfy our intuitions on this point, to say something about how and when these two events are related. It is not enough to say, as Taylor does, that my swimming the channel and crossing it are related by something mysterious called "kinship" - since they have the same causes and effects — and leave it at that (Taylor 1985). This does not count as either a theory of events or as an integral part of a theory. What is required is a more systematic account which will take the place of the event theory originally intended by Davidson, and allow us to make sense of the sort of statements

under consideration. One step towards doing this would be to look at a theory which makes the necessary distinction between actions, but which proposes that they are related in some plausible way, and see whether it would be possible to combine this with the logical form proposal.

One candidate for this is Goldman's theory of actions (Goldman 1970). The intention expressed by Goldman is to follow this attractive procedure: give an inductive definition of an act token, then demarcate a certain class of "basic" act-tokens and a certain set of relations, and finally say that anything which bears an appropriate combination of these relations to a member of the originally demarcated class of act-tokens is itself an act-token. Goldman actually takes these steps in the development of his theory out of sequence, and concentrates on the nature of the relations first. Under the present circumstances, where the action-events are still taken to be particulars, the explanation of the relation(s) between them is also the first priority.

The fundamental relation, and the one which also seems to be of most importance to the proposed synthesis, is called "level-generation" or simply "generation". To take an example: if we suppose that John's moving his hand is basic (en passant, Davidson may not be perturbed by this hypothesis since he takes bodily movements to be basic in some sense), then each of the following is "generated" by this basic action

John's frightening a fly.
John's moving his king.
John's checkmating his opponent.

In the second chapter of "A Theory of Human Action", which is devoted to giving an explanation of the relations, we are told that level-generation is an asymmetric, irreflexive, transitive relation holding between ordered pairs of act-tokens of the same agent and that, in general, it will obtain when the "by" locution is appropriate — as will be seen, this last observation is not always true of Goldman's relation.

Level-generation is divided into four types:

(a) causal generation.
(b) conventional generation.
(c) simple generation.
(d) augmentation generation.

The generation relation can be represented in each case by an arrow. For example (type (a))

(2) S's flipping the switch -> S's turning on the light.

Causal generation (which is carefully distinguished from causation, and is defined in terms of the latter) is defined as follows: act-token A of agent S causally generates A' of S if and only if i) A causes E, ii) A' consists in S's causing E. Goldman clarifies this by saying that in such examples S's act token A has a certain effect, E, and because it has this effect, S may be credited with performing act A'. In the above example, S's turning on the light is the generated act. (One of the ways in which generation differs from causation is that, when one act/event is caused by another, one act/event is subsequent to another.) Type (b) generation is characterised by there being a rule or convention according to which S's performing A justifies the further ascription of A' to S, e.g.

(3) S's extending his arm out of the window -> S's signalling for a turn

In conventional generation there was a combination of rule and circumstances which characterised the relation. In simple generation, the existence of certain circumstances conjoined with the performance of A ensures that the agent has performed A' — so it's like type (b) but without the rule; e.g.

(4) S's jumping 6' 3" -> S's outjumping George

The final type of generation is of special interest to the enterprise of providing a theory of events to complement the logical form proposal. The characteristic of augmentation generation is one of entailment (i.e. a logical connection) between statements of the performance of the relevant actions; e.g.

(5) S's saying "hello" -> S's saying "hello" loudly

So, if S performs A', S performs A: "The fact that the generating act is not merely performed, but performed in a certain manner or in certain circumstances, entails that the generated act is also performed" (p28). It is of interest not only that this sort of (adverbial) phenomenon is included as a species of "generation", but also that Goldman remarks that it "does not completely mesh with the other three forms of generation". It is also remarked that it is not intuitively as attractive as the other species of generation — significantly, it seems to fail the ""by" test".

Goldman's examples of conventional and simple generation cast doubt upon the notion that "by" can always be accommodated in terms of causality. Such an idea is expressed by Davidson (Davidson 1971) when he claims that it is causality which allows us to redescribe actions in ways in which we cannot redescribe other events. In the light of Goldman's suggestions, the account of "by" which we will put forward in this chapter will not be tied to causality.

If it were possible to combine the Davidsonian approach with Goldman's theory of event relations, then it might be urged that in this final, and rather unsatisfactory, definition of generation has been found a point of contact, or a way into bringing about the synthesis. It may be possible to discount augmentation generation and simply retain the logical form proposal with respect to the question of adverbial modification. In this way we could say that my walking and my walking slowly are the same action. It is also worth pointing out that the first type of generation, causal generation, being dependent on the causal relation, which is taken to be primitive, might be exploited in order to bring the two theories closer together. Davidson also takes the causal relation to be primitive, and acknowledges the importance of the relation in a theory of events. It would be pleasing if it were possible to build up actions by using a relation which is grounded out in causation. This would allow us not only to separate two actions in "A killed B by shooting him":

(6) $(\exists x)(\exists y)[kill(A,B,x) \ \& \ shoot(A,B,y) \ \& \ by(x,y)]$

but would provide an explanation of how they are related — how one is "generated" by another. The relation between the actions is not itself causal but is founded on causation: presumably, it would be possible to "dig deeper" than this level of logical form in order to see how, for example, the relationship between actions is dependent on their effects; it looks as if some sort of decomposition would be necessary at this stage given Goldman's allusions to the causal nature of predicates specifying the act tokens under consideration (as will be seen, Hornsby has proposed that further analysis is required in order to characterise actions by their effects, and explain the behaviour of "by").

The two other types of generation, conventional and simple, are a little more difficult to accommodate within any proposed combination of theories since they are not causal in nature and yet they pass the "by" test. Until their seemingly circumstantial nature is well worked out it would be convenient, at least, to simply stipulate that certain actions are related in this way. It should now be possible to give a background theory to the view of the logical form of "by"-sentences whether we take a particularist line as Davidson originally intended or whether we amalgamate the current suggestions to a synthesis of theories already outlined by Kim (Brand and Walton 1976) and Taylor (Taylor 1985).

However, the project under consideration is not without difficulties. First of all, we may have misgivings about the idea of combining aspects of two (or more) theories without giving any thought to the commitments which each brings with it. As the writings of Davidson, Goldman, Hornsby and others show, it is difficult to ignore, for example, questions of basic action and it is against the background of answers to such questions that the present conception of semantic theory is developed. Clearly, theory synthesis will have to take account of this. It may also be objected that if the intention were to extend the Davidsonian programme in order to explain the problems under consideration, then this should proceed without interfering with those parts of the theory which are already firmly established as "oiling the wheels of the semantic machinery" — i.e. a unifier theory of action and events. It may be the case that there are other ways of accounting for the phenomena which do so within the constraints of the austere framework which is already in place.

A less programmatic objection to the current way of representing the "by"-relation concerns its relationship with adverbs and adverbials. Surely when we say that someone did something by doing something else we are using the "by"-phrase in much the same way as we would use an adverb like "violently". It may be used as a response to a "how"-question in much the same way as any other adverb which tells us something about the way in which one action was performed. In view of this, the initial premiss that "by" expresses a relation between actions begins to look suspicious — we would expect "by" constructions to behave more like other adverbs do in logical form, which involve predication on one event. This view will be developed in the following sections. We could regard our first attempt to accommodate "by" — using an unsatisfactory theory of events — as laying down a challenge. Our final task will be to see if it is possible to develop an account which is more in harmony with the overall theoretical perspective which has been adopted.

I would now briefly like to mention another possible way of thinking about the "by"-relationship which also embodies the idea that it is appropriate to abandon the action identity thesis. This is due to J.J. Thomson (Thomson 1977: 47-50), and raises the question of event summation, which we were willing to leave alone in the second chapter. Taking the example of Sirhan's killing Kennedy by shooting him, Thomson proposes that, instead of thinking of these two actions as being identical, we should regard the shooting as *part* of the killing. Thomson seems to find that motivation for this claim in a comparison between the shooting/killing example and episode of typing a sentence: the event of my typing the previous sentence began with an event that consisted in my typing "T", which was followed by my typing "a", which was followed.... She says this:

> Some people have felt strongly inclined to say that Sirhan's shooting of Kennedy was his killing of Kennedy; *no one* could plausibly say that my typing a "W", or my typing an "e", was my typing the sentence — these were surely only parts of my typing the sen-

tence.
(Thomson 1977: 49)

I believe that this is a misleading comparison to make, and so should not incline us to think that the shooting is part of the killing. It is more plausible to think of the typing of individual letters as parts of the action-event of typing the sentence. The difference between the two cases simply resides in the fact that, whereas Sirhan killed Kennedy by shooting him, I did not type the sentence by typing "T". In other words, it seems to be incorrect to motivate an analysis of the behaviour of "by" by appeal to an example which does not express the "by"-relationship. Note that we could say that I typed the sentence by typing "T", followed by "a", followed by.... But in this case we would simply say that the typing of the succession of individual letters was equivalent to typing the sentence.

Lawrence Davis considers Thomson's approach to events to be an instance of what he labels the "the moderate theory" (Davis 1979: 33). In the preceding discussion of Goldman we considered a theory of action which clearly denies the identity thesis; the moderate theory falls between these theories and the unifier theory we supported earlier. It can be described in terms of Goldman's generation types. The moderate theory says that when Smith makes Jones happy by praising him (causal generation) there are two actions; however, when Smith praises Jones by saying "Well done!" (noncausal generation), there is one action. According to Davis, the explanation is as follows. In the first of these cases, Smith's making Jones happy has as "parts" the events of Smith praising Jones and Jones becoming happy. By contrast, in the second case, there is no motivation for saying some event was part of Smith's praising Jones which was not part of his saying "Well done!": the further circumstances which obtain are conventions of English, which are not events.

Thalberg advocates a moderate theory and articulates it in terms of component events (Thalberg 1977). The idea of one action-event being part of another underlies his theory and appears to be motivated by an analogy he finds between events and material objects (pp110-111). From comments made in Chapter Two, it is clear that we resist making such an analogy. In addition, we have also suggested that a general account of the "metaphyics" of event summation is too ambitious a task to attempt — it is likely that there are a number of ways in which actions and events "combine", which are revealed in the conceptual resources of natural language. On some occasions, Thalberg talks of the restrictions on welding (basic) events together being spatio-temporal, and locates an action in terms of its agent.

Perhaps the strongest reason for rejecting a moderate theory as underlying an account of "by" is that it would have the consequence that on certain occasions "by" would be a relation between two actions (corresponding to causal generation), while on other occasions only one action would be involved (non-causal generation). However, the "by" phrase, which functions as an adverb, does not have a role which fluctuates in this fashion.

In view of the general characteristic contribution that "by" makes to the sentences under consideration, we should be interested in representing "by" in a uniform way.

3.2. Decompositional approaches

In an earlier discussion, Katz's approach to decompositional semantics was described. It looked as if the motivation and theory were not in accord with the sort of position that we have been taking. However, proposals have been made which seem to advocate a cementing together of the two approaches. What follows is an assessment of such claims, which should help us to decide upon which strategy to adopt — it remains to be seen whether "by" requires decomposition.

If we were to go along with Goldman we would explain how we can do one thing by doing another by appealing to the claim that our doing the first thing is distinct but related to our doing the second. In accounting for the relationship which "by" seems to express in this way, an insight about the causal relation has been exploited: the most common type of generation, causal generation, involves explication in terms of the causal relationships between actions and their effects. This idea in turn can be seen as involving the decomposition of verbs/predicates which are alleged to "include" a causal element. It has been claimed that all we need to do in order to explain the phenomena which are our present concern is to recognize this level of analysis and to include it in the logical form proposal. The result is that Goldman's insight about the causal nature of some predicates is retained but not at the price of having to deny the important thesis that certain actions are identical. This way of accounting for the phenomena has appeal to those who work within a Davidsonian framework (including Davidson himself). Whether or not the authors of the following proposals would consider themselves to be doing decompositional analysis, I shall continue to label them as such (Katz is an all-out decompositionalist, the following writers are not).

In "Adverbs of Action" (Davidson 1985b, Vermazen and Hintikka 1985) Davidson has slightly altered his original account of action sentences. The sentence "Arthur destroyed the aeroplane" receives the following paraphrase:

> There exist two events such that Arthur is the agent of the first, the second is a destruction of the aeroplane, and the first caused the second.

This may be further regimented as

(7) $(\exists a)(\exists e)$[Agent(A,a) & Destroy(the plane,e) & Cause(a,e)]

Here, then, the idea is expressed that we decompose the verb (also invoking participant roles in the form of Agent) and then give the logical form.

Hornsby, in "Actions" (Hornsby 1980a) and "Verbs and Events" (Dancy 1980, Hornsby 1980b), supports the intuition that some sort of verbal decomposition is required in order to get the analysis of action sentences right. She is more explicit than Davidson about how this sort of manoeuvre would help bring into line such unruly elements as the alleged "by"-relation. Having given an account of how what is usually seen as the asymmetry of "by" can be explained using the idea of the effects of an action (so that "he f-d by g-ing" but not "he g-d by f-ing") she goes on to say (Hornsby 1980b):

> This may show that some of "by"'s behaviour cannot be described without carrying out further analysis than what is necessary for giving the logical forms of sentences containing it. (footnote 14)

The idea seems to be emerging that we can provide action sentences with a logical form but that we need to postulate a further stage of decomposition in order to take care of those with the form "A f-d by g-ing".

In a recent paper, Lombard has defended an account of the representation of action sentences which involves verbal decomposition (LePore and McLaughlin 1985, Lombard 1985). More specifically, he proposes a treatment of transitive verbs of action which retains the Davidsonian identity thesis for certain actions. Lombard concludes his discussion of the topic with some comments which are of special interest to us, since they make recommendations concerning the "by"-relation:

> The asymmetry and irreflexivity of the "by"-relation... is the asymmetry and irreflexivity of the *causal* relation. But what "by" relates are not actions, but the *effects* of actions. Jones' action has at least two effects: the switch flips and the prowler becomes alert... The latter effect is a more remote effect than the former and has the former as a more immediate cause... Effects are related by the "by"-relation as they are more and less remote effects of an agent's action. (p.281)

The sort of logical forms which Lombard assigns to sentence, and which permit the above interpretation of "by" can be illustrated by the following schema for a transitive verb of action, "a is f-ing b":

(8) $(\exists x)(\exists y)(\exists z)$[Action(x) & Agent(a,x) & Event(y) & Subject(b,y) & State(z) & Subject'(b,z) & Being-f-ed(b,z) & Terminates(z,y) & Cause(x,y)]

According to Lombard, "a is f-ing b" becomes "a is the agent of an action that causes a change in b that terminates in b's being f-ed". "By" is a relation between effects that an action causes, like "y" above.

One motivation for the proposals was a difficulty, pointed out by Wallace, with the interaction between transitive verbs of action and certain adverbs. We shall return to "Wallace's problem" when we present our own proposals for adverbial expressions.

There are a number of features of Lombard's representations which are of special interest to us. For example, his account makes essential use of events. In addition, when providing a verb-splitting analysis of transitive verbs of action, and in his representation of the "by"-locution, he relies heavily on the causal predicate; he goes as far as to say "Transitive action verbs are "causal verbs"" (Lombard 1985: 276). Lombard gives some specific examples of the sort of transitive verbs of action that he intends to accommodate (Lombard 1985: 269): "kill", "melt", "throw", "move" and "sink". Such verbs are clearly action verbs unlike "is", "become", "see" or "own". This fits in with Davidson's original account which dealt with verbs of action.

At this point we may object that it is possible for "by" to involve verbs of action which are not transitive. In view of this the question arises of whether Lombard's analysis could deal with these cases as well. Taking an example like

Brown signalled by waving,

the suggestion made by Lombard requires us to construe "by" as a relation between effects of a common cause, i.e. Brown's action. In other words, we would have to say that Brown's action of signalling/waving "causes" him to have signalled/waved. However, in using this sort of analysis for intransitive verbs, a confusion seems to have occurred. The problem arises because "having signalled" is not an event which is the effect of Brown's action (i.e. which is caused by Brown's action); rather, it is a terminal state of the action itself (see paraphrase of Lombard's proposal for transitive verbs on the previous page). In other words, the use of Lombard's proposals to accommodate intransitives involves confusing the effects of an action with its terminal states.

Despite problems with intransitive verbs, it could be argued that Lombard's analysis is still good for the class of transitive verbs of action.

An example which arises from Davidson's work is "Smith crossed the Channel by swimming it". Here we have "by" linking two transitive verbs of action. However, if we consider representing the verbs and "by" along the lines suggested by Lombard, the resulting analysis sounds odd. We would be committed to saying, for instance, that Smith's action "caused" the Channel to be swum or crossed, which seems an unusual

paraphrase compared to, say, Smith action causing Jones' death. This is not an isolated example. The following verbs raise the same sort of problem:

Smith avoided the obstacle.
Smith scaled the cliff.
Smith imitated Mrs. Thatcher.
The detective inspected the body.
Smith evaded the police.

All of these transitive verbs participate in the "by" relation and all report actions. However, as with the first example, something like "Smith's action "caused" Mrs. Thatcher to be imitated" leads us to question whether we are entitled to use such an analysis in these cases. The obvious reply to such an objection is: it may *sound* odd, but this does not mean that the analysis does not work. This reply can be countered, however, since it is possible to isolate the phenomenon which results in the oddity of the resulting analysis: in each of the above cases, the effect which the agent's action is thought to cause is a "relational change". This means that the change in the patient is not really itself an alteration, but is dependent upon an alteration (a non-relational change) of the agent. The question now arises of whether relational changes are admissible as events which are effects caused by an action. Lombard's position is that relational changes are not genuine changes and do not qualify as events for inclusion in the analysis (Lombard 1985: 269, Lombard 1986). In view of this, there are transitive verbs of action which are not covered by Lombard's proposals. This also means that a class of "by"-locutions, which involve at least one of these verbs, cannot be represented as Lombard suggests, since the "by"-relation which is put forward relates events (non-relational changes) not relational changes.

When describing the type of transitive action verbs to be covered, Lombard proposes that the analysis be confined to what he calls the "primary sense" of such verbs (Lombard 1985: 277). This is intended to rule out examples where "multiple agency" is involved:

> Multiple agency is introduced when something else must be done (either by [the agent] or by another), in addition to "what [the agent] does". (Lombard 1985: 277)

So the analysis does not apply, for example, to Jones' coercing Smith to melt the chocolate, even though Jones' action causes the chocolate to be melted. Another example is given: the King poisons the Queen's tea, and the Queen, having drunk the tea, dies. This is

thought to involve multiple agency, due to the action of the Queen, and it is suggested that an extended sense of "kill", which is not covered by Lombard's analysis, is associated with it. It now looks as if Lombard's theory does not cover Anscombe's similar example of the pump operator poisoning the town's inhabitants by replenishing the water supply, which is often taken as a paradigmatic example of the "by"-locution and accordion effect. Considerations of the preceding paragraphs to the effect that the theory cannot cover common examples of the "by"-locution which involve both transitive and intransitive verbs of action, as well as the point just raised, mean that Lombard's theory will not be adopted for the representation of the "by"-locution.

Since one of the aims of the thesis is to accommodate a family of expressions including "by", "in order to", "for the purpose of", etc (as we have mentioned in the Introduction and will discuss in Chapter Six, Gustafson (Gustafson 1986) has built upon Wittgenstein's idea that such expressions represent a new move in the action language-game), we would want an account of "by" to bear an appropriate relationship to accounts of the other expressions. There does not seem to be any clear way of relating Lombard's suggestions for "by" to the other constructions we wish to accommodate. Regarding our family of target expressions, we may observe that expressions like "in order to" contain an intentional element (i.e. an intensional one) and that "by" has been characterised as intensional by Castaneda in that it depends essentially on certain properties (Castaneda 1979). We have already seen in Chapter Three that Davidson's austerely extensional paratactic manoeuvre is unsatisfactory in its treatment of problem examples supplied by Burge and others - there we saw that the logical form proposal could not be separated from other issues in the way that Davidson would like in order for his austere measures to be implemented (e.g. Davidson 1984: 93–108). In addition to this, as we shall see further on, there is no evidence of a demonstrative "that" in certain intensional constructions that we shall be dealing with (a view shared by Hornsby). Since the standard Davidsonian line for dealing with intensional constructions is not appropriate, and since, for the reasons given above, the sort of decompositional theory advocated by Lombard is unsuitable, a different approach is required which is not affected by the difficulties we have outlined. As we shall see, the line taken by Burge, who provides a different treatment of intensional constructions from Davidson, is a suitable candidate. We shall accommodate syntactic simples in our representations and employ the less austere measure of Burgian corner quoted expressions (augmented with the idea of linguistic role outlined in Chapter Three) in our treatment of the target expressions. This method will allow us, among other things, to represent the first-person element of intention which Castaneda has pointed out is missing from Davidson's own suggestion (Davidson 1980: 127).

In our treatment of syntactic simples we shall be following Hornsby, Davidson and LePore inallowing for a level of meaning analysis. As we have seen, Hornsby postulates a level of analysis below the level of logical form in order to fully describe "by"'s behaviour. Davidson considers such a level as accounting for those inferences which are not captured in his representations (e.g. Davidson 1980: 106). In employing meaning analysis to distinguish between "knows" and "believes" LePore echoes this theme (LePore and McLaughlin 1985: 158). In addition to treating syntactic simples in logical form in this fashion, our representations will retain adverbs as predicates, quantify over events, remain first-order, and make manifest Davidson's action theory. Before dropping the standard Davidsonian treatment of intensional constructions, we shall employ it in an illustrative exercise in the final section of this chapter.

3.3. An alternative approach (by way of a Davidsonian exercise)

Having described and evaluated some potential solutions to the problem of what it means to say that someone performed one action by performing another, which involved modifying the background theory of events and actions (thereby losing the identity thesis) or retaining the important identity thesis and decomposing the action verb, this section presents a proposal which retains the theory of action-events without involving decompositional analysis. One way of stating the proposal is to carry out what might be called a "Davidsonian exercise". The idea is to use a device which hails from another corner of Davidson's theory and requires an alteration to the logical form proposal. The device or manoeuvre in question is the parataxis which is employed to regiment sentences of indirect discourse. In Chapter Three some doubt was cast upon the standard account of parataxis. As a consequence of the following discussion we shall abandon it. However, it will be of use in articulating the suggested representation of "by".

As we have seen, Davidson proposes to treat sentences of indirect discourse within an extensional framework. The example which receives the most extensive treatment in "On Saying That" (Davidson 1968, Davidson 1984) is

(11) Galileo said that the earth moves.

We are encouraged to think of (11) as

(12) Galileo said that. The earth moves.

Platts thinks that the logical form component of the paratactic proposal can be used to deal with other natural language phenomena (Platts 1979). In "Ways of Meaning" it is

suggested that attributive adjectives (i.e. those which do not permit straightforward regimentation as one-place predicates) be treated as two-place predicates with one place reserved for a demonstrative, e.g.

(14) "Theo is a large flea" becomes
Large(Theo,that): x is a flea

which is partly supported by the suggestion that "Theo is large" is similar to "He said that" which can be a complete declarative sentence, "but one which requires there to be some other utterance, to which the demonstative refers, before that indexical sentence can be assigned a truth-value" (p188). Note that the demonstrative refers to "an open sentence or utterance thereof" (p187). As well as Platts' use of the paratactic manoeuvre, we have already come across uses by Hornsby and Boer and Lycan. It is clear that there is some precedent for requiring that the demonstrative refer to an open sentence in certain circumstances.

Before moving on to the suggestion pertaining to sentences of the form "he f-d by g-ing" it would be as well to touch upon some characteristics of the "by"-phrase as it appears in this sort of construction. It has already been pointed out that "by"-phrases seem to work in the same way as (other) adverbs — they seem to fit naturally into the sort of response to such questions of the form "how did you do so-and-so?" If we wish to proceed with Davidson's programme and attempt to bring natural language phenomena under the sort of theory proposed, then it would seem natural to want to represent "by" as some sort of predicate. It will also be necessary to act on the idea that the "by"-phrase involves redescription of, and provides more information about, an action when giving its representation in logical form. Hornsby, in "Actions" and "Verbs and Events", makes the observation that the verb which forms the "by"-phrase is never inflected for person or tense no matter what happens to the other verb in the sentence: the "by"-phrase remains invariant with respect to the rest of the sentence. The following sort of sentence seems a little odd:

(15) *Brutus killed Caesar by (he) stabbed Caesar.

This type of observation leads Hornsby to speculate that "by g-ing" does not report an action but behaves like a modifier of predicates — in "Actions" it is remarked that the predicate must be an event-predicate. We shall not endorse the modifier treatment, but propose an alternative which is in line with Davidson's proposals for adverbs, and which manifests the commitment to the action theory supported earlier.

The fact that this sort of construction has been construed as a modifier of some sort may make us suspect that it is possible to employ parataxis to achieve our ends in the same way in which that device was used in another alleged province of modifiers or operators, the propositional attitudes. However, this conjecture does not constitute a proposal. One way of thinking of sentences of the form "he f-d by g-ing" can be illustrated using the example

(16) Smith injured Brown by shooting him.

Suppose that I have just shot Brown and that I tell someone of this. This person may say something along the lines of "Smith injured Brown by doing that." Here, my informant seems to be referring to a description of an action which I have just given. As a first step in the proposed analysis, it might be suggested that part of what (16) means can be represented by the component sentence

(17) Smith injured Brown by (doing) that.

where the demonstrative awaits a description of the action. The question will arise of how this description of the action is to be represented. An intermediate stage in the analysis would be to take the liberty of representing (16) as being comprised of the components:

(18) Smith injured Brown by (doing) that. Smith shooting Brown.

In any case, the idea is that examples like (17) count as sentences which refer in some way to a description of an action. The notion that the description in question describes an action which has already been identified using a previous description can be put another way: when sentences like (17) are used it is to express the fact that the action in question fits or satisfies a description. Now, one method of representing this idea of fitting a description is to use an open formula for the description — the open formula can be thought of as picking out a certain class of things which satisfy it in the same way that a description can be "placed over" those things which it fits. "By" now expresses a relationship between an action and a description under which it falls in certain circumstances. As noted above, the idea that an open formula is the appropriate referent for the demonstrative "that" has been invoked on other occasions. In fact Tuomela has speculated that open sentences could be thought of as representing event types which singular events exemplify (Tuomela 1977:21). The logical form for (16) is now something like

(19) $(\exists e)$[Injure(S,B,e) & By(e,that)]. Shoot(S,B,x)

where the free variable in the second sentence is a variable which ranges over events. It is noticeable that the schema of which (19) is an instance goes some way towards substantiating Hornsby's claim that "by"-phrases do not actually report an action (this being connected with the observation that "by"-phrases remain uninflected). Without an existential quantifier preceding the open formula, the formula itself says nothing about the existence of an action — it is a description which is related to the action in question in virtue of the behaviour of the predicate "By" whose argument places are filled by an action-event and a demonstrative.

It should be clear that, since the causal relation is not invoked (at this stage at least) to explain or analyse the way "by" works in these constructions, it is possible to cover more than Goldman's causal generation. As the predicate which represents "by" involves only actions, demonstratives and open-formulae/descriptions, examples of what was called conventional generation can be accommodated, e.g. for "John made a pass at Mary by winking at her" we have something like (simplifying the role played by prepositions)

(20) (∃e)[Pass(J,M,e) & By(e,that)]. Wink(J,M,x).

The same sort of move should be available to us for simple generation. For instance, the notorious example of Smith crossing the channel by swimming it (which would, I believe, be counted as an instance of simple generation) goes over as follows

(21) (∃e)[Cross(S,the channel,e) & By(e,that)]. Swim(S,the channel,x).

These examples involve existential claims about only one event. However, what Goldman referred to as augmentation generation, whose most salient feature seemed to be failure of the "by"-test, is accommodated in the usual way by representing adverbs like "loudly" as predicates of events/actions — since the predicate "By" is not invoked. Note that because "by" is not seen as a relation between two actions, the thesis that in certain circumstances a swimming can be a crossing is preserved.

In spite of the advantages that the above analysis seems to have, there are some attendant problems which suggest that this "Davidsonian exercise" is really just the first step towards getting the logical form of "by" straight. As Hornsby has pointed out (in correspondence), if we are to accept the analysis as an account of logical form we must convince ourselves that there really is evidence of Davidson's parataxis — we mentioned earlier that Higginbotham thought that, instead of being a disguised demonstrative, "that" straightforwardly behaved as a complementiser in cases of alleged parataxis. More importantly, perhaps, the account given may have unwanted commitments.

If we suppose that Smith kills Brown by shooting him, and that he shoots him by moving a finger, then we would be able to say, of "e" (the killing) that it has the following property:

(λz)[By(z,that)]. Shoot(S,B,x).

However, since the killing is a moving of a finger, it seems to follow that this same property can be ascribed to a moving of a finger, i.e. Smith moved a finger by shooting Brown.

What needs to be captured by the analysis is the idea that an action is performed, qua killing, by shooting. In other words, "by" is not simply to be regarded as acknowledging a relationship between an event and a single description. Instead, we could say that "by" expresses a relationship between an event and two descriptions ("killing" and "shooting"). This would enable us to say that an action, which is a moving of a finger, is performed, qua killing, by shooting. Although an odd-sounding paraphrase, it is in accord with a Davidsonian action theory, which allows that an event can fall under a number of descriptions, and avoids the above result.

Having arrived at the general way in which "by" should be treated, it is clear that our earlier doubts about the appropriateness of the paratactic manoeuvre would resurface if this particular method of representation were employed. Something like the following would be the result of regimenting (16):

(22) $(\exists e)$[Injure(S,B,e) & By(e,that$_1$,that$_2$)]. Injure(S,B,x). Shoot(S,B,y).

Here, two demonstratives are needed to pick out the required open sentences. But, even if our Davidsonian exercise persuaded us that one was appropriate, it would be stretching a point to insist that "by" involves *two* concealed demonstratives (i.e. two "that"s present in the underlying representation but not in the "surface" sentence). There is little enough evidence for there bring one disguised or concealed "that", let alone two. The best route to take would be to abandon the standard Davidsonian manoeuvre for the constructions in which we are interested and rest content with something like the corner quoted expressions which Burge employs in representations of sentences which seem to exhibit intensionality (Burge 1977). Burge remarks that, although corner quotes are to be taken quite literally, they may be regarded as a convenience for denoting the proposition or component of proposition expressed by the symbols they enclose. In Chapter Six, we shall suggest that this idea could be exploited in providing our own representations. What we have shown here will be useful in considering the treatment of reports of complex and purposeful

action. In particular, it is clear that it is possible to construe logical form proposals as "implementations" of our chosen action theory, and that we can account for the misleading "surface" form of sentences which say that we perform one action by performing another. Instead of there being two actions performed, there is one action related in a special way to the two descriptions under which it falls.

Putting it this way also circumvents the sort of argument put forward by Goldman (Goldman 1970) in support of a fine-grained or multiplier theory of actions. Suppose that Smith gave offence by signalling and signalled by waving. In view of this, we can say that Smith's waving was not done by signalling. According to a theorist like Goldman, this can be put schematically as:

By(o,s) and ~By(w,s)

(where "o" is "gave offence", "s" is "signalled" and "w" is "waved"). Supporters of a multiplier theory would claim that this shows that the waving is distinct from the giving offence. In terms of our earlier suggestion that "by" related an action and a description, we might have been committed to saying that an action was performed both by signalling and not by signalling. We would have had to acknowledge both of the following:

(∃e)[Offence(S,e) & By(e,that)]. Signal(S,x).

(∃e)[Wave(S,e) & ~By(e,that)]. Signal(S,x).

The adoption of an interpretation of "by" which recognises two descriptions and which did not employ parataxis would not be affected by the sort of argument put forward by Goldman.

Conclusion

In the preceding sections, a characteristic of human action, expressed in sentences of the form "x f-ed by g-ing", has been isolated and proposals have been made regarding its treatment. It has been suggested that, instead of abandoning a broadly Davidsonian action theory or endorsing a decompositional approach to representation, we represent "by" as expressing a relationship between an action and two descriptions under which it falls. As a result of the considerations of this chapter, our representational apparatus will not involve the use of Davidson's manoeuvre. A more detailed treatment of "by" will be given in Chapter Six. Chapter Seven will use broad features of the "by"-characteristic to motivate proposals concerning the cognitive representation of human action.

Chapter Five complements this chapter, which considered the accommodation of "complex action". The following chapter contains a discussion of intention, action and refraining from action. It is proposed that a distinction be made between acting

intentionally and intending to act. This distinction is employed in an account of refraining. Both Chapter Four and Chapter Five are required for an informed discussion of representational issues in the final two chapters.

CHAPTER 5

Intending to Act, Acting Intentionally, and Refraining

Introduction

Having explored the notion of performing one action by performing another, we have been able to make a start on the treatment of reports of complex activity. It would be useful now to examine the notions of intention, intending and intentional action prior to making proposals about the treatment of reports of purposeful behaviour. In addition to accommodating these sorts of reports, we set ourselves the task of illuminating the nature of refraining from action. The following discussion is an examination of intention and refraining which indicates that the two notions are closely associated.

The resulting account of refraining makes use of a distinction between acting intentionally and intending to act. It will be proposed that occasions of refraining embody both of these "intentional elements". In order to motivate this proposal, competing theories of refraining and accounts of intention will be examined and assessed. The account put forward in this chapter will accommodate the examples ("data") which these theories bring with them, and will lead to suggestions for representing attributions of refraining and intention in Chapter Six.

1. Intention and Refraining

I would like to address the questions of what it means to say that someone refrained from performing an action, and what the relationship is between acting intentionally and intending to act. Forbearances or refrainings have long been a topic of discussion in action theory in general and in Davidsonian approaches to action in particular. It is hoped that, at the same time as steering us towards a conclusion about the nature of this sort of non-action, the following discussion will illuminate the distinction between intending and intentional action; in fact, the account of refraining will make essential use of just such a distinction. The notion of refraining to be adopted should become clearer in due course (the term "refrains" will be used throughout, although some writers have used other terms for the same idea). To begin with, however, it would be as well to introduce some themes which will be present in following sections. The second subsection contains a discussion of recent theories of refraining which are relevant to present concerns. In the third subsection, an alternative, and more general account will be described in the light of earlier proposals

and the data which motivated them. As mentioned above, the account presented will clarify our ideas about "intentions".

1.1. Preliminaries

There are a number of issues which have arisen in the discussion of theories of human action in general and accounts of refraining (omitting, not-doing, withholding etc) in particular. Broadly speaking, it is possible to separate two questions about the nature of refrainings:

> i. (ontological question) are refrainings ("interesting" cases of omitting) actions?
> ii. (notional question) when is it correct to say that someone refrained from performing an action?

There appear to be basically two possible answers to i. — either refraining are actions or they are not (although at least one recent writer, Vermazen, seems to suggest a third answer: that only some refrainings are actions). I say "appear" because we typically experience a certain amount of aporia when considering such questions. Our own account of refraining should show why we are uncertain as to the sort of answer that should be given to i. These alternatives implied by i. will be covered in the next section which is primarily concerned with the exposition of competing accounts of action and refraining, and which will therefore also address question ii. This second question will demand more of our attention: the answer to it will be consequent upon explicating the relationship between refraining and intention. Further questions follow on from i. and ii.:

> What is the result of an omission?
> How long does an omission take?/How long does it take to refrain?
> At any given moment, how many actions does an agent refrain from?
> What is the relationship between refraining and other components of the action theory, e.g. "basic actions"?

With respect to the last question, the basic actions alluded to are taken to be akin to those put forward by Danto, Hornsby, Goldman and Davidson and others (e.g. Davidson regards as "primitive" those actions that are not done by doing something else (Davidson 1971, Davidson 1980: 59)). As suggested above, another, more crucial, element of the theory with which an account of refraining must mesh is intention. This term has different interpretations in different accounts of human action: it has been taken to mean (the act

of?) intending, the "content" of such an attitude or the content of the report of that attitude. Moreover, the expression "s intended to x" has been interpreted as either or both of the following:

i. "S A-ed intentionally" — i.e. S actually A-ed.
ii. "S had the intention of A-ing" — i.e. S might not have A-ed.

When we say that someone acted intentionally, we understand that an action has been performed. On the other hand, if we report that an agent intended to do something, we can be interpreted as remaining silent on the question of whether the agent actually performed the action. The semantics of "intends" and "intentionally", which will be presented in Chapter Six, will reflect this difference. We shall be consistent and use the verb "intend" to mean ii, and to contrast it with the adverbial use ("intentionally") represented in i. The distinction between the adverb and the verb will be reconsidered later in this chapter. The meaning of "intention" will be clear from context: it will either refer to the psychological state associated with intending to act, or it will be used to mean the subject matter of the study of acting intentionally and intending (e.g. "the study of intention").

The following section discusses proposals for the treatment of refraining made by by Brand (Brand 1971), Moore (Moore 1979), and Vermazen (Vermazen and Hintikka 1985, Vermazen 1985). This is followed by a return to the question of intention and a proposal which expresses a relationship between refraining and intention.

1.2. Theories and Data

We might characterise the theoretical discussion of refraining as being concerned primarily with those "interesting" cases of not doing. In order to see what is meant by this we must draw a distinction between not doings which divides them into cases where the agent could be said to refrain from performing an action, and cases where the agent is said simply to be doing nothing at all. No doubt it is possible to describe a whole spectrum of cases of the "interesting" kind where we are not concerned with simple inaction, but it will be less confusing, and more realistic if we start off from the simple classification alluded to above: until we are forced to do otherwise "not doings" will either be cases of "refraining" or of "inaction". Brand uses simple examples to illustrate this distinction (Brand 1971). The policeman who keeps his arm at his side and does not shoot the fleeing youth *refrains* from shooting him. The man asleep on the couch does nothing at all with respect to answering the telephone ringing in the bedroom — a case of *inaction.* In spite of the distinction just drawn, it seems likely that a necessary (though not sufficient) condition of

both refraining and inaction is that it is not the case that the agent performs the action specified in reports of refraining or inaction (this idea will be reconsidered in the third subsection).

Brand describes his project as more Carnapian than Austinian in that he wishes to develop a formal language fragment to talk about the various kinds of not doing which borrows from ordinary usage, but does not purport to represent it adequately. Despite this, a useful characterisation of the issues is presented. Cases of inaction (when an agent, S, is inactive with respect to performing an action, A) are said to exist when the following conditions are met:

i. it is not the case that S performs A; and
ii. it is not the case that S refrains from performing A.

This sort of definition seems to be along the right lines since, although we may be content to say that we are inactive with respect to an infinite number of actions, it is not clear that we would be happy to say this of the more interesting cases of not doing. However, the definition does require that the notion of refraining itself be defined. Before moving on to this it is worth noting that, although Danto also distinguishes between refraining and inaction, the way in which the distinction is represented symbolically is unsatisfactory and appears to be beg the question concerning the interpretation of refraining. Danto represents "s is inactive with respect to a" and "s refrains from performing a" as (1) and (2) respectively, where "D" can be interpreted as "performs" and "N" is the negation operator (Danto 1966):

(1) N(sDa)

(2) sDNa

This choice of representation is to some extent due to the claim that the logic of "perform" is strictly analogous to the logic of "believe" — hence the alternative positions of the negation operator in (1) and (2). What seems to have been disregarded here is that the operator applies in (1) to a sentence and in (2) to a singular term, referring to an action; this equivocation is not present in the logic of "believe". It is precisely the role of "not" in expressions of not-doing (qua refraining) that provides one of the problems for any account of refraining, and it obviously will not do to assimilate it directly to the sentential operator interpretation.

In giving an account of refraining itself, where refraining is an action, Brand takes as his primary intuition that refraining is a species of causal prevention. One event causes another to occur or prevents another from occurring only if the events are causally relevant to each other. Intuitively, it is suggested, one event is causally relevant to another when the former is either causally necessary or sufficient for the latter, or the former is causally necessary or sufficient for what happens when the latter does not occur. With these ideas Brand defines the not-doing locution "an agent, S, causally prevents something from happening": S causally prevents E from occurring if and only if there is some action A that S performs such that S's performing A causally prevents E from occurring. In addition to this notion of prevention there may also be other kinds of prevention relevant to the language of not doing or refraining. With this in mind we can reproduce Brand's definition of refraining, *D5* (p.49).

(D5) S refrains from performing A if and only if
i. it is not the case that S performs A; and
ii. there is some action, B, that S performs such that S performs B in order that S's performing B prevents S's performing A.

In our earlier example the policeman refrains from shooting the youth when he keeps his hand by his side in order that this prevents his shooting the fleeing youth. Brand remarks, "Idiomatically, we would simply say that he refrains from shooting the fleeing youth *by* keeping his hand by his side" (p.49). This idea is generalised and it is suggested that expressions of the form "S refrains from performing A" can be taken as circumlocutions for expressions of the form "S refrains from performing A by performing B". In Chapter Four, we saw that our theoretical perspective commits us to the view that if we say that one action is performed by performing another, then there is really only one action to be acknowledged. In turn, if we say that someone refrained from an acting by doing something else, we seem to be committed to the view that refraining is an action or a description of an action. That the situation is actually more complicated than this will become clear in due course.

Earlier it was observed that so-called non-basic actions are characterised by expressions of the form "S A-ed by B-ing". Since the above comments suggest that all refrainings must be non-basic, which is thought by Brand to be an unsatisfactory result, he proposes that an action is basic if it is an action in which the agent intentionally brings about a single event. A refraining can now be said to be a basic action if the action labelled "B" in D5 is a basic action. Our own action theory only requires us to say that every action is basic under *some* description.

A response and reaction to Brand's proposals comes from R.E. Moore who argues that Brand's account of refraining is mistaken and proposes an alternative (Moore 1979). It is claimed that a fundamental error in Brand's account of refraining emerges when we consider the class of what might be termed "*precautionary actions*". Here is Moore's example of a precautionary action. Suppose I wish to use a word in this chapter which I am not sure how to spell; just to be safe I look it up in a dictionary and copy it out letter by letter. In this case it is true that

(a) I have not misspelled the word,

(b) I have looked it up in order that I do not misspell it,

(c) it was precisely because I looked it up that I did not misspell it (supposing initially that I had an incorrect spelling in mind), but it is not the case that I have refrained from misspelling the word.

Rather, Moore suggests, I have *avoided* misspelling it by looking it up. This and the example of Odysseus binding himself to the mast in order that he will not later jump overboard (intentionally) when the sirens sing to him could be said to satisfy the conditions of Brand's D5 (see above) even though they are not refrainings. Thus, it is concluded, D5 is faulty.

It would be helpful to see a direct contrast between a refraining and a case of precautionary/preventative action in order to see just where they differ. Consider the misspelling example again. Suppose that this time I thought it would be clever to misspell the word; I entertained the idea of doing so "intentionally". Finally, I decide not to misspell it, and, fearing that I might still do so unintentionally, I look up the word as before. Now I did refrain from misspelling the word. According to Moore, the three obvious differences between the two examples are as follows:

i. only in the second case was I initially inclined to misspell the word,
ii. did I consider misspelling it,
iii. did I decide not to misspell it.

The first difference is rejected as a necessary condition for refraining because, Moore claims, one may refrain from skydiving or hang-gliding without ever having had the slightest inclination to engage in them. We shall return to this point. Since it follows from the fact that I have decided not to do A that I have considered A-ing, it is decided to adopt iii. as part of the definition of refraining, which is given as follows.

(*) Agent S refrains from A-ing if and only if
i. it is not the case that he As;
ii. he has decided not to A; and
iii. it is because of this decision that he doesn't A.

The definition is tightened up by allowing only expressions which are capable of denoting an intentional action to be substituted for "A".

The definition (*) is open to the following objection. It is not true that every intentional action requires a prior decision, so is a prior decision always required for cases of refraining? (This question might be more pertinent to us if we were to replace "decision" with "intention"; we will attempt this in the next section, but for the nonce Moore's terms will be used.) There are two obvious places to look for a counterexample to

the claim that every refraining requires a prior decision: reflex actions (no time for a decision) and habitual actions (no need for one). It is found that constructing suitable examples which could be called instances of "reflex refraining" and "habitual refraining" is by no means easy. Moore finds that he cannot do so. Furthermore, any resulting phrases sound distinctly odd. For an example of "reflex refraining", Moore tries to imagine a baseball catcher who must learn to face an oncoming ball, i.e. he must learn not to turn his head. In this case, has the catcher "refrained" from moving his head without deciding not to turn it? I agree with Moore's conclusion that this does not constitute an instance of refraining. Since these ideas and Moore's conclusion require further consideration, we can pick them up again in the next section.

A discussion of condition iii of the definition (*) reveals one way in which refraining differs from other actions. Clause iii can be taken to mean that the decision not to A is a *necessary* condition for the agent's not A-ing in cases of refraining, which is closely associated with Danto's claim that potency is a necessary condition for refraining (Danto 1973). If I cannot turn on certain light then a decision on my part not to turn it on will not be a necessary condition for its not going on. In general, if I believe wrongly that I have the power to A, then whenever I believe that I am refraining from A-ing I am mistaken.

At first blush, it is not clear that we can be so sure as to make this generalisation. It seems a little odd to say of someone, after he claims to have refrained from performing an action, that he is mistaken. The reason for this may be because in attributions of refraining we are concerned, to a large extent, with the psychological state of the agent; this appears to be one way of differentiating refraining from inaction. It must be conceded, however, that if the agent knew that, for example, he could not turn on the light, it would make no sense to say that he refrained from doing so. We shall return to the role played by a psychological state in our own account of refraining.

There is still a problem with the definition (*) since its conditions would be satisfied by the following example which is not an instance of refraining. Suppose that I decide to read a book instead of watching television. I am so proud of myself that I jump for joy, and accidentally kick a hole in the television set. Now I find that I would do anything to be able to watch television. Here we would not want to say that I had refrained from watching television. In order to get round this sort of example, a fourth condition is introduced into the definition of refraining, to obtain the following, (**), which is Moore's final proposal:

(**) An agent S refrains from A-ing if and only if:

i. it is not the case that he As;

ii. he has decided not to A;

iii. it is because of this decision that he doesn't A; and

iv. the decision not to A does not deprive S of the opportunity to A.

The final example of an account of refraining to be discussed in this section is Vermazen's "Negative Acts" (Vermazen 1985). The idea here is to provide an account of refraining which is in accord with Davidson's theory of action. It is claimed at the outset that there are *some* negative acts (i.e. refrainings which are actions). Since Vermazen's account of refraining is required to mesh with Davidson's theory of action, it is compatible with the claim that actions are bodily movements. However, instead of simply interpreting the idea of a bodily movement generously to include such "movements" as standing fast, or assimilating all negative acts to the case of an agent's body not moving at all, an alternative route is taken.

It seems reasonable to suggest that a negative action is attributed to an agent because the movements he is displaying (including not moving at all) are also describable as not A-ing. Here is an example. Suppose that Smith is confronted with a table laden with food; he has a desire not to eat them (perhaps he is on a diet) and a belief that if he keeps his hands occupied, by twisting the buttons on his jacket, then this will amount to his not eating the food. Here it seems plausible to identify the refraining with the action of twisting the buttons. Note that it is not merely that the button-twisting and the refraining happen at the same time, but that the agent twists his buttons in order not to eat. Vermazen suggests that the class of negative actions or refrainings be restricted as follows: what we count when we attribute a negative action to an agent is what he *intends* not to be doing, i.e. it is a necessary condition of refraining from A-ing that the agent intend not to A. Furthermore, the intention that Vermazen is interested in is the sort that makes the action in question an "intentional action" (p98). To return to the case of Smith's twisting his buttons in order not to eat, the button-twisting could be correctly said to cause his not eating, that is, to cause its being the case that he does not eat. However, it does not cause his refraining, the result of which is his not eating:

> The connection between his not eating and his [refraining] is that since the former is caused by an act of his (the button-twisting), it licenses a redescription of that act as [refraining], that is, a negative act. (p102)

Goldman's term "generation" is used to describe this case by saying that a negative act is generated by a positive act (Goldman 1970). It can be shown that negative acts can generate other negative acts, but the more interesting cases are those in which the refraining is not generated by another action at all but is primitive or basic (a less arbitrary definition of a basic refraining than Brand's). According to Vermazen,"the latter has been our real quarry all along" (p102).

If the agent has refrained from doing A by doing something else then this intentional omission can be referred to as "displacement refraining", Vermazen suggests (unlike Brand,

Vermazen does not think that we always refrain by doing something else). Redescription of the action is unproblematic in such cases: in the example used above there is a bodily movement, Smith's twisting his buttons, to serve as the "ultimate descriptum". Now, as it turns out, those cases of refraining which, it has already been proposed, are primitive — Vermazen refers to them as "simple refrainings" — do not admit of an ultimate descriptum:

> Positive acts are bodily movements; negative acts, when they are resistings or identical with positive acts, are also bodily movements; but simple negative acts, mere refrainings, need not be bodily movements at all. They are attributed to agents in virtue of the inhibitory role played by the appropriate pro-attitude/belief pair, but they are not themselves events. (p103)

The consequence of this (from which our account will differ) must be that some but not all refrainings are actions, since if some are not events they cannot be actions. Davidsonian theory now counts positive acts, resistings and displacement refrainings as actions, but not simple refrainings. Whether or not the distinction between displacement and simple refrainings is a suitable one to make will be discussed in the following section. In addition, we may be inclined to distinguish between Vermazen's displacement refrainings and Moore's precautionary actions: both seem to require that the agent do something else in not-acting, but we might still have reason to keep them separate. Whether this second distinction can be accounted for in any way will also be considered in the next section. This will contain a discussion of "intentionally" and "intends" which will lead to our own account of refraining.

1.3. Evaluation and an Alternative Account

That there is a distinction between refraining and doing nothing at all (inaction) has already been remarked. It has also been proposed that a necessary condition for refraining from A is the "result" of refraining from A: that A does not take place. However, the answer to the question "what is the result of refraining from A?" requires a little thought, as the following example, due to Talja (Talja 1985), shows. Suppose that Smith is taking a walk by the river and sees a child drowning in the water. Let it be the case that Smith loathes children, and, since there is noone else around, "refrains" from rescuing the child. Unbeknownst to Smith, Brown has heard the child's cries and rushes over to rescue it, and subsequently succeeds. Now, if the result of Smith's refraining from rescuing the child is that the child is not rescued then something has gone wrong. Clearly, we must say that the result of this intentional omission is that the child was not rescued by *Smith*. This point is similar to one made by Castaneda regarding the essentially first person nature of intentions. We shall return to Castaneda's thesis in the final section of this chapter. Such observations

might lead us to suspect that, in certain circumstances, it is misleading to talk about actions in isolation from the agents involved (agents are implicitly acknowledged in all action reports), or that the effect of the element of agency on events justifies a specific treatment of actions rather than a general treatment of events. We have already mentioned this phenomenon in Chapter Four.

In considering alleged acts of refraining it has been convenient, and perhaps necessary, to understand the notion in a generous way. Thus, any case of "interesting" omission, or more precisely, intentional omission has been covered by the term. It has been found, however, that attempts at a more fine-grained taxonomy of not doings have been made (Moore 1979, Vermazen 1985). Moore distinguishes between refraining and precautionary action, and assesses candidates for necessary conditions for refraining by observing that I may pass up turnips (refrain from eating them) without ever having an inclination to accept them if they were offered to me. However, it is unclear whether we can be so confident. It might seem to us that since my passing up turnips requires no thought or self-control on my part, we would be less likely to describe it as an intentional omission. Moore's actual account of refraining draws upon the notion of an agent deciding not to do A. By couching the discussion in terms of intention, it will be suggested in what follows that this more usually associated notion is actually more suitable.

If we are to speculate that the interesting omissions are the intentional omissions, or that refraining has an "intentional element", we should be more precise about the nature of this element. The distinction alluded to earlier in the chapter ("acting intentionally" vs. "intending to act"), which we support, has been thought by Lawrence Davis to be of great importance in any action theory (Davis 1979). This sort of separation is supposed to be valuable whether or not it is proposed that every action is "intentional". It is tempting to think that every intentional action is preceded by a state or act of intending, i.e. if we do something intentionally, then we intend to do it — called by Adams "the simple view" of intentional action (Adams 1986). It is this temptation which would endanger the distinction, and which must therefore be resisted. Davis provides the following reports of reflex, absent-minded and impulsive actions to illustrate the point that we may say of someone that he did something intentionally without saying that he intended to do it (p.59), i.e. we can have reflex/absent-minded/impulsive actions which are intentional actions, but which are not intended actions:

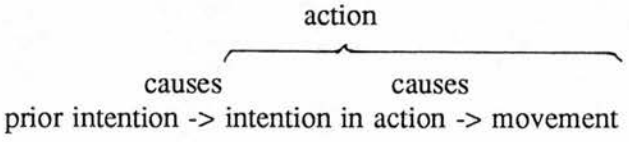
> Sue stepped on the brake when a child suddenly darted out in the path of the car.
> Seth absent-mindedly brushed his teeth.
> Sol tore off the thread he had just noticed hanging from his shirt.

In each of these cases the action was intentional all right, but the agent did not intend to go ahead and do it. It is concluded by Davis that

> Our study of "intention" must divide into separate treatments of "acting intentionally" and "intending". (p59)

The present study also respects this division. At least analogous to this distinction is one which is in evidence in Brand's later theory of action (Brand 1984) and another which is made by Searle (Searle 1980). Although Brand thinks of intentional action as being intended, the psychological terminology which he employs in his theory is useful for elaborating upon our distinction. Brand proposes that all action has a proximate cause which is termed an "immediate intention" and which is composed of two parts: a cognitive component (monitoring and guidance) and a conative component (being "moved" to act). Furthermore, a non-immediate "prospective" intention is required for action which is "intentional". It is the cognitive side of Brand's proposals, which involves attitudes and representations, that is of interest to us, rather than his speculations on conation. The cognitive component of prospective intention is a plan, where the notion of planned activity is a liberal one not requiring conscious deliberation. Now, the idea of intentional action may not fit exactly over ours or Davis', but the notions of monitoring and guidance, on the one hand, and planning, on the other, are useful ways of thinking of the distinction made earlier between doing something intentionally and intending. The two theories are not strictly comparable because, as we have mentioned, whereas Davis claims (like us) that intentional action does not require the agent to intend it ("planning"), Brand thinks that intentional action needs "planning" (intending). Presumably, he would not refer to Davis' examples of reflex action as examples of intentional action. What this amounts to, I think, is that what is taken to be "intentional action" varies, while other ideas can remain fixed, i.e. the meaning of "intentional action" changes.

Once again, we might not want to buy the whole of Searle's action theory, but some of the terms which are used in its articulation may serve our purpose. He distinguishes between "prior intentions" and "intentions in action": all intentional actions have intentions in action but not all have prior intentions. Searle uses "prior intention" and "intention in action" where Brand might use "planning" and "monitoring and guidance", but his view is similar to Davis'. I can do something intentionally without having formed a prior intention to do it, and I can have a prior intention but not act on it. Diagrammatically, we have this (Searle 1983):



This is supposed to account for Chisholm's "uncle-example" which runs as follows (Chisholm 1966). Suppose I intend to kill my uncle; my having formed this intention makes me nervous and distracted. While driving over to my uncle's house to commit the murder my state of nervousness causes me to kill a pedestrian, who turns out to be my uncle. In this case I intended to kill my uncle, this intention caused me to kill him, but I did not kill him intentionally. According to Searle, this is explained by the fact that the middle stage of the sequence illustrated above was missed out. Here, the prior intention/intention in action distinction seems to correspond quite well with the intending/acting intentionally distinction.

Davis concludes his discussion of intending and acting intentionally with a case "which blurs the distinction somewhat" (p81): intentional omissions (refrainings), the sort that we are interested in.

> Intentionally not doing an A, then, is not doing an A when one's not doing an A can be explained... by one's being in a state of intending (now) not to do an A. (p82)

The suggestion here seems to be that "intentionally" be defined in terms of "intending now" (despite warnings about observing the distinction), perhaps because Davis does not think of refrainings as actions and therefore not suitable for adverbial modification (according to Davis actions are volitions, but an omission is the failure of a volition to take place).

Rather than saying that occasions of refraining are where our distinction breaks down, I suggest that, in order to give an account of the nature of refraining, the distinction must be observed. This notion forms the basis of our treatment of refraining. Instead of blurring the distinction between acting intentionally and intending to act, as Davis does, I would like to propose that refraining embodies these two intentional elements: in Searle's terms, every refraining requires a prior intention to not do A and an intention in action of not A-ing. Using Brand's action-language, refraining requires planning (in the appropriate sense) and monitoring and guidance (during the refraining). In less theory-laden terms, we could suggest that refraining requires both that the agent intends not to A, and that he not-A's intentionally. Thus, if refraining is regarded as an action, it differs from other actions which may be performed by an agent. For in normal circumstances ("normal" cases of action other than refraining) we can intend to do A, whether or not that intention is "realized", and A may or may not be done intentionally. But for it to be true to say that an agent has refrained, I am suggesting, not-A must be both intended and done intentionally. This claim can be supported if we remind ourselves of examples which have caused problems for previous theories of refraining. The account just outlined will explain the anomaly of certain putative cases of refraining.

Both Moore and Davis observe that we would be disinclined to admit that there are

such things as habitual, reflex or impulsive refrainings. In short, it seems unlikely that we ever "just refrain" in the sense that we might just "lash out" at someone. Refraining seems to differ from more "normal" forms of behaviour in this way. Searle gives an example of a man who "just hits" another which is described as an action without a prior intention (Searle 1980), but it would be incorrect to say that we can refrain without a "prior intention". It is for this reason that problems are encountered when we attempt to construct examples of reflex or habitual refraining. In the examples which are cited by Moore in the discussion of reflex and habitual refraining, we would be more inclined to deny that a refraining had taken place than to allow that the agent "just refrained". These observations can be accommodated without recourse to the theoretical terms of Searle and Brand by saying that the sort of examples alluded to do not qualify as refrainings because, although they might require that something was done intentionally, they do not show that it was intended.

Moore also considers alleged examples of "precautionary action": it is claimed that these are not genuine cases of refraining (e.g. Odysseus' having himself bound to the mast in order to foil the sirens). Another, more specific, example of human action, which threatens an account of refraining, involves the agent destroying a television set because of his intention ("intending") not to watch it that evening. In both cases, we may observe, the agent has intended not to do something, but it is not the case that the agent does not do it intentionally. For this reason, the example is close to Chisholm's "uncle example" and so may invite us to utilise Searle's terms to describe what is going on: there is a prior intention, but no intention in action. Similarly, we could utilise Brand's "planning" and "monitoring and guidance", but in a suggestive way which does not require us to buy into either theory of action. Due to the absence of one sort of intention, neither precautionary action, nor the television example, count as cases of refraining.

Earlier on in this section, it was observed that we may not be prepared to say that I refrained from (made an "interesting" omission) skydiving, hang-gliding, or eating turnips if I never had the slightest inclination to perform these actions. This could be because these examples in fact lack one or both of the intentional features required for refraining. They are more likely to be instances of inaction rather than refraining.

To return to another point made earlier, the paragraph before last provided the reason why Odysseus' behaviour could be considered as precautionary action, while Smith's twisting the buttons of his jacket is referred to as a "displacement refraining" (i.e. a species of refraining proper): although Odysseus intended not to jump overboard, his not jumping overboard was not (at the time) done intentionally; the latter feature of "monitoring and guidance" with respect to the action not performed *was* present when Smith refrained from eating by twisting his buttons. In other words, the Odysseus example is one more case in

which refraining is ruled out because an "intentional component" is missing.

So far it has been possible to get away without saying outright whether refraining is an action. Vermazen holds that some refrainings are actions, while others, "simple refrainings", are not. Brand proposes that all refrainings are actions; we always refrain by doing something else. There are reasons why we would not want to include refrainings among our actions as well as reasons why we would. Although they share with other actions the possibility of having causes and effects, as well as the possibility of being incorporated into Goldman's initially attractive-looking theory of level-generation, they do not seem to allow for habitual, impulsive or reflexive descriptions. In contrast, we are quite willing to allow that uncontroversial cases of action can be reflex, habitual etc. In addition to this, it is not clear which position to side with on the issue of whether we always refrain by doing something. In view of our uncertainty, it could be argued that it is advantageous simply to identify refrainings with the relevant psychological states or attitudes of the agent, which could be broadly construed as events and therefore capable of participating in the causal nexus. However, I think that most satisfactory solution is to recognise that the difficulty is really a consequence of occasions of refraining involving both an action refrained from, and a psychological attitude. The first criterion means that an event falls under a different description, in that it does not fall under the action-description refrained from — in this sense we are siding with Brand's earlier theory. The second criterion requires us to recognise the presence of a psychological state (event, broadly). So, cases of refraining are occasions on which we need to recognise the occurrence of two events, and it is this which causes problems if we simply want to categorise refraining as just a psychological attitude or an action. This will mean that the truth-conditional semantics or logical form of "refrains", which will be covered in the next chapter, will be unusual and call for a specific treatment. It should be clear from remarks in earlier chapters that it is not the object of the exercise to decompose the verb into components like "intentionally" and "intends", i.e. the results of analysis will not be found in logical form. However, the preceding examination will have implications for the treatment of "refrains" in the sense of giving the semantical part of speech of the expression.

2. Discussion

Until recently, Davidson has not had very much to say on the topic of refraining. However, in a reply to Vermazen, he has endorsed Vermazen's account of negative acts (Davidson 1985a). He goes a little further than Vermazen in discussing the logical form of sentences which say a "negative act" was performed. His remarks suggest that, unlike us, he analyses refraining in terms of intentional action, or doing something intentionally. The

result is that my refraining from eating a persimmon is treated in terms of "I intentionally did not eat a persimmon"; this receives the paraphrase "It was intentional on my part that it was not the case that there existed an action of mine that was an eating of a persimmon". It is noticeable that Davidson's example of refraining fits in rather well with our own account of refraining:

> Suppose that although I love persimmons I believe they are harmful to my health; I resolve to abstain from eating persimmons, and this afternoon I remain true to my resolve though a persimmon is available. Then not only is it the case that I did not eat a persimmon, but not eating a persimmon is something that I did. (p.218)

There are a number of differences between Davidson's account and our own. Where we have articulated an account in terms of "intentionally" and "intends", Davidson considers only the adverb. This may be because he does not recognise the distinction, or he is content to blur the distinction which we have adhered to. In addition, his paraphrase suggests that reports of refraining are to be accommodated by employing the adverb "intentionally" in their representation. In our own characterisation of "refrains", in Chapter Six, we will not decompose the verb into "intentionally" and "intends". This sort of idea arose in the discussion of Emmon Bach in Chapter One, when it was suggested that "analysis" has implications for logical form, but that its results are not to be plugged straight into logical form.

Having said something about intentions — the distinction between "intends" and "intentionally" — and refraining, it is necessary to add a little more detail to our preliminary account before going on to propose specific treatments. The feature of intention, and of ascriptions containing an intentional element, to which I would like draw attention concerns the way in which an agent is related to his or her intentions. Castaneda points out that intentions are irreducibly first-person — i.e. the "I" who is intending always appears in his own intentions (Castaneda 1966, Castaneda 1967, Castaneda 1975). I think that this view is correct, and that when we say something like "Smith intends that Brown run for president" we mean something like "Smith intends that Smith make it possible for Brown to run for president". What is involved is always a first-person intention. If John intends to go to the theatre, then he does not merely think of the action of going to the theatre: he thinks of it as *his* action. I believe that our previous discussion indicates that, when we say that an agent did something intentionally, once again we are talking about an agent's first-person conception of himself as subject. (Castaneda does not distinguish between doing something intentionally and intending to do it.) It will become clear in the next chapter that other constructions require the representation of this feature; some, like "believes", require it in some circumstances but not in others. In addition to the first person thesis, Castaneda presents his own theory of action, which, on the face of it, is rather different from a Davidsonian theory. This account, as well as his account of "noemata"

(what is supposedly before the mind when we have an intention), is more contentious than the suggestion that an irreducibly indexical element is involved in certain of our ascriptions. In view of this, I will concentrate on the latter and disregard some of Castaneda's other suggestions.

Perry has taken up the theme introduced by Castaneda (Perry 1979). Taking the case of belief, he argues that the indexical involved in the content of sentences like "I believe that I am making a mess" is "essential": when it is replaced with other designations of me, the result is no longer an explanation of my behaviour, and no longer an attribution of the same belief. The phenomenon will receive treatment in the next chapter which is concerned with the representation of a class of expressions pertaining to the attribution of intentional and "complex" activity. The present chapter, and the one before it, have paved the way for such an attempt by their exploration of the ideas which seem to underlie these attributions. Having rejected other possible accounts at this stage of scrutiny, we are now in a position to try our ideas out in a characteristically Davidsonian form of representation. The repercussions of this exercise will be examined in the final chapter.

Conclusion

In this chapter we have given an account of refraining which exploits a distinction between intending to act and acting intentionally, and which is in accord with the action theory endorsed in earlier chapters. Furthermore, our theory of refraining and intention accounts for troublesome examples arising from the discussion of other theories.

The concerns of the preceding sections have fallen within what has been traditionally called "the philosophy of action". However, as the remarks of Chapter One should have made clear, the present project regards as beneficial the interaction of this sort of work with semantical considerations. The distinction that has been made and the proposal for refraining will provide part of the motivation for the proposals regarding the underlying representations of characteristic reports of complex and intentional action. In fact the aim of Chapter Six is to provide proposals for the accommodation of a broad range of constructions pertaining to intention and the less simple cases of action. Once this has been achieved, the final chapter can apply the ideas about action that we have developed to a broader range of approaches to the representation of action.

CHAPTER 6

The Treatment of Reports of Complex and Intentional Action

Introduction

This chapter contains proposals for the treatment of (adverbial) expressions of purposeful and sophisticated activity. Together with the final chapter, it is concerned with representational issues. The treatments which are put forward in what follows are motivated by considerations of earlier chapters. For example, a more complete account of "by" will be given, along with proposals for intentional adverbs. Throughout, the idea that an important role of adverbs is to provide a redescription of actions will be exploited. This notion complements our unifier theory of action presented earlier. We shall be adopting Burge's stance on non-extensionality rather than Davidson's; in other words, extensional parataxis will give way to corner-quoted expressions.

The chapter is divided into three main sections: the first describes the aim and motivation of the project; the second explains some of the devices which are necessary for satisfactory representation of target constructions; the third sets out "logical forms" for these constructions.

1. Preparatory remarks

The object of the section is to provide some motivation for the treatment of the class of sentences that is to follow in subsequent sections. It will become clear why we think of such sentences as falling into a class, and what sort of problems arise when we attempt to accommodate them within our chosen form of representation.

1.1. A Wittgensteinian characterisation

The sentences and expressions with which we are concerned may be described as a "family". I choose this term with Wittgenstein's later work on language in mind (Wittgenstein 1953). There it was proposed (roughly) that if a number of items or things all have some of a number of different features then they may be thought of as a family. The best known family, which Wittgenstein thought central to his ideas on language, is the family of games. In the same way, I would suggest, the sentences which form part of the present study can be collectively thought of as sharing a number of features in a "familial" way (e.g. psychological attitude, indexicality, redescription). Furthermore, since the features

are in some way related to the problems encountered in accommodating them we may refer to them as a "problem family". To give them a label, they may be thought of as those expressions which can be used to attribute intention and apparent multiplicity of action.

The use to which Wittgenstein's observations on language may be put is not confined to the above characterisation of our study. In a less frequently referenced work, Wittgenstein puts forward his ideas concerning a class of sentences which bears striking similarities to the class or family with which we are concerned (Wittgenstein 1981). The similarity is also noticed by Gustafson in his recent work on action and intention (Gustafson 1986). The sort of sentences which are comparable to sentences imputing purposeful activity are those which are concerned with appearance and perception. Gustafson thinks that the "developmental-conceptual" facts about perceptual language and thinking suggest and support a parallel in connection with action language. It is thought that only after the mastery of a common, and in some sense "neutral", descriptive vocabulary does the vocabulary of "looks", "seems" and "appears" find a use. The latter presents a new and further possibility in the language of perception. We teach "It looks to me...", "It looks to him..." after the subject has mastered other parts of the common descriptive vocabulary. In Wittgenstein's terms, such a transition constitutes a new move in the language-game. Regarding this and the analogy with intention-action language, certain of Wittgenstein's remarks are interesting (Wittgenstein 1981):

> The red visual impression is a new *concept. (no. 423)*
> A child learns to walk, to crawl, to play. It does not learn to play voluntarily or involuntarily. (no. 587)

Nor, would I suggest, can we progress from "simple" action language to language which acknowledges intentional and complex activity without mastering a new move in the language-game. The transition from the language of purpos*ive* to purpose*ful* action requires the acknowledgement of relationships between actions and between action-descriptions, and an appreciation of the way in which the agent is specified. The treatment of the problem family which will be described in due course, and whose "intra-familial" relationships we will be diagramming, will help us to see what this move looks like.

1.2. Summary and problems

On other occasions we have mentioned the need to find a way of representing the phenomenon of adverbial modification in general within a broadly Davidsonian framework. It is hoped that the attempt to provide the logical forms of expressions of complex and purposeful activity will be a step in that direction. In saying this, it is apparent that we are anticipating that the expressions which are the targets of this part of the present study

behave in the same way as adverbs at the level of logical form. Consideration of the "by" relation has allowed us to take this line in one case, and it will become evident that in most of the other cases in which we are interested the same line may be taken.

It would be helpful to remind ourselves of the position that we reached in our discussion of "by". It became clear that, in view of the theory of action that we had endorsed (the present project could, in some sense, be thought of as an implementation of an action theory), the adverbial "by" would best be represented as expressing a relationship between an action-event and at least one description under which that action could fall. I say "at least one description" because there was evidence (due to Hornsby) that simply construing the "by"-relation as involving one description would have unwelcome results. More specifically, it would be possible to conclude from the fact that Smith killed Jones by shooting him, and that in shooting him Smith squeezed the trigger, that Smith squeezed the trigger by shooting Jones. In view of this, it was speculated that our representation of "by" requires that two of the relata be descriptions. This idea will be discussed further in the next section.

There is a similarity between Hornsby's objection to our proposed representation of "by" and an objection raised by Wallace in response to the attempt to capture the behaviour of certain prepositional phrases within a Davidsonian framework (Wallace's problem is reported by Parsons (Parsons 1980)). Suppose that, in one action, Smith, by striking the cue ball in a certain way pockets the 8-ball into the side pocket and the 9-ball into the corner pocket. According to the usual way of representing action sentences with prepositional phrases, we obtain:

(1) a. $(\exists x)$(Pocket(Smith,8-ball,x) & Into(side,x))
b. $(\exists y)$(Pocket(Smith,9-ball,y) & Into(corner,y))

Now, on our austere version of Davidson's theory of action, there is just one action performed which is both a pocketing of the 8-ball into the side, and a pocketing of the 9-ball into the corner. So we could say:

(2) $(\exists x)$(Pocket(Smith,8-ball,x) & Pocket(Smith,9-ball,x) & Into(side,x) & Into(corner,x))

But (2) entails:

(3) $(\exists x)$(Pocket(Smith,8-ball,x) & Into(corner,x))

(i.e. Smith pocketed the 8-ball into the corner) which is false. Given the similarity between Wallace's problem and the observation made by Hornsby, it would be pleasing to be able to shed some light on both in the analysis which follows.

It will help to make the object of the present study a little clearer if, before moving on to the next section, the expressions with which we are concerned are listed. The "family" of constructions which merit attention in the study of reports of complex and purposeful action are these:

"by"
"in order to"
"intentionally"
"intends"
"for the purpose of" (to be defined later)
"by" qua "enable" (to be defined later)
"refrains" (from earlier discussion)
other constructions

The last item, "other constructions", includes commonly discussed adverbs like "slowly", (which seem to require something like a comparison class to obtain a satisfactory representation of the way in which they behave) and adverbs such as "rudely" which, depending upon their position in the surface sentence, have a manner or a subject oriented reading. In connection with the "Wallace problem" just described an attempt will also be made to account for the example involved in that case as well. I have included two verbs among the adverbs because they are particularly relevant to our study.

2. Apparatus for Representation

This section contains descriptions of some of the sorts of "tools" which have been developed in attempts to render similar constructions to the ones under study in canonical idioms similar to the one chosen here. The requirements which are outlined are not the only ones which could have been considered or chosen. However, they are in accord with our observations on related topics made in earlier chapters and they provide a first step in the characterisation of the phenomena in which we are interested.

2.1. Castaneda's proposals

There are two ideas which are due to Castaneda's work on intentions that I would like to include in the present analysis. The first of these is the thesis that the contents of certain of the attitudes — the "practical" attitudes rather than the propositional attitudes — contain an ineliminably "first-personal" element. The second imported notion is that of a "qua-entity", a term which we borrow and put to a slightly different use than was intended by Castaneda.

In a number of places (Castaneda 1966, Castaneda 1967, Castaneda 1975), Castaneda has argued for the idea that an irreducible part of any theory of "intentions" should contain reference to the fact that intentions rely for their sense on a constituent which behaves like the first person pronoun. Here we are thinking of intentions as the contents of intendings, not as intendings themselves. In saying this I am careful not to talk about "acts of intending" for obvious reasons (this may commit us to a possibly incoherent action theory). The case of intending and intention is the most often cited instance of a practical attitude. While we do not subscribe to all his views, we do hold in common with Castaneda the idea that a distinguishing feature of practical attitudes — for our purposes those constructions which impute intention — is that they always contain an element which is associated with the sort of first person reference brought about by uses of "I".

Whilst practical attitudes *always* require a first person element, beliefs, for example, sometimes have first person contents. The following illustrative example is one of belief rather than intention. In putting forward his thesis, Castaneda has argued that sentences like

(4) Smith believes that he (himself) is healthy.

are closely tied to first person reference. The above sentence attributes to Smith the belief which Smith would express by asserting:

(5) I am healthy.

In (4) it was necessary to specify the "sense" by including "himself" — i.e. we are not saying that Smith believes that someone else is healthy. In the case of intentions, such clarification would not be required: all intentions are first person intentions" (there will be only a "he (himself)" reading). To return to (4), Castaneda introduces the term "he*", thus:

(6) Smith believes that he* is healthy.

This is called a "quasi-indicator" and is said to exhibit the following characteristics:

i. there is an antecedent in the immediate discourse, outside the scope of the cognitive verb;

ii. there is a clear indication of how the person to whom the attitude is attributed refers to the person designated quasi-indexically — i.e. via "I";

iii. the indexical reference is not made by the speaker but is attributed to the person to whom the belief (or intention) is ascribed.

We shall be using the idea of a quasi-indicator in something like this sense in the following sections.

The second idea to be borrowed from Castaneda is mentioned in passing by him in an appraisal of Goldman's theory of action (Castaneda 1979). The notion of a "qua-entity" mooted there is relevant to our earlier discussion of the "by"-locution (a construction which was seen to be central to theories of action). At the end of our discussion we concluded, as mentioned in the first section, that the representation of "by" requires two descriptions as relata. This move is necessary to avoid unwelcome results. The move itself is like saying that we must consider an action from two perspectives — an agent performs an action in the capacity of x-ing by y-ing. Or, to put it another way, an agent may, for example, perform an action, which is done, qua killing, by shooting. What Castaneda might refer to as a qua-action is the action in question considered as falling under the first-mentioned description.

2.2. Burge's proposals

We have discussed Burge's proposals for the representation of the demonstrative "that" elsewhere. The purpose of this section is to summarise the results of that discussion and to comment upon another problem which Burge sees his theory as covering and which is relevant to the present treatment of expressions of purposeful activity.

Burge's account of demonstrative expressions makes use of the idea that on many occasions we utter open sentences (Burge 1974). It is the free variable which occurs in such a sentence that corresponds to the use of a demonstrative or other indexical element. Let us take, as an example sentence which contains a demonstrative, the following:

(7) That dog is an animal.

The method used to accommodate a sentence, or an utterance, like this results not in the usual T-sentence but in a conditional, the consequent of which is the relevant T-sentence. This way of dealing with the truth conditions of sentences containing demonstratives is

called the conditional assignment method. As mentioned, what are true or false for Burge (as for Davidson) are utterances, or assertions made by someone. These assertions contain individual acts of reference to objects and are made by a speaker in a certain place and at a certain time. Such notions are taken to be the conditions of normal assertability. With this in mind we can state the antecedent schema, "p refers to y with "that" in s", which is involved in the conditional assignment method

(8) (∃x)(Reference(x) & By(x,p) & To(x,y) & At(x,t) & With(x,t,"that",s))

The demonstrative is usually subscripted to mark a particular occurrence, but for our purposes this may be omitted. In (8) x ranges over acts of reference, p over persons, t over times and s over sentences. "To(x,y)" expresses a partial function from acts of reference to objects — it is partial because of the possibility of reference failure. The following "macrotreatment" of our example sentence (7) is proposed (notation will be explained in due course):

(9) (x)(y)[Reference (x) & By(x,p) & At(x,t) & With(x,"that","That dog is an animal") & To(x,y) →

("That dog is an animal" is true(p,t) ↔ Animal([y]Dog(y)))].

Now (9) reads: "For any x and y, if x is an act of reference by p to y at t with "that" in "That dog is an animal", then "That dog is an animal" is true with respect to p and t if and only if the object which is a dog is an animal". The term of the form

$[x_i]A(x_1...x_i...x_n)$

is an open singular term in which the bracketed variable marks the free variable that represents the demonstrative. The whole thing is equivalent to (where "ι" is the iota-operator):

$(\iota z)(A(x_1...z...x_n) \& z=x_i)$

Since "x_i" is not bound it can be quantified from outside the term. The square bracket notation is used because it is thought that it better represents the syntax of English.

In addition to a free variable analysis of demonstratives and indexical expressions, Burge has also given an account of belief sentences (Burge 1977). In his exposition, he makes use of corner- (or quasi-) quoted sentences to represent the contents of sentences

attributing beliefs. At the end of Chapter Four, we commented on the sufficiency of this method of representation in contrast to Davidson's standard paratactic manoeuvre. Burge suggests that corner quotes can be taken quite literally (Burge 1977:342). Quine originally introduced them into his logic as a more elastic method for referring to expressions than ordinary quotation (Quine 1951:34). A way was needed of referring to intended contexts of unspecified expressions:

$\ulcorner (P) \urcorner$ $\ulcorner P \leftrightarrow Q \urcorner$

This amounts to quoting the constant contextual backgrounds "( )" and " $\leftrightarrow$ ", and imagining P and Q written in the blanks. In view of this characteristic, we could think of corner quotes as being "less shielding" than ordinary quotation. There is some ambiguity in the use of corners which can be resolved. For example, in

$\ulcorner (a')P' \urcorner$

it is questionable whether the quantifier is to be understood as the result of putting variable a' (e.g. "y") in "( )" or the variable a (e.g. "x") in "(')". In other words, we must decide whether accents and the like belong to the contextual framework. I think that, since such marks help to form another variable, they should not count as part of the contextual framework. This will be assumed in the proposals which follow. In addition to recommending that corner quotes can be taken literally, Burge points out that we can also regard them, for convenience, as denoting the proposition or component of proposition expressed by the symbols they enclose. Should we need to invoke notions pertaining to propositions, we could turn to a suitably modified version of a suggestion mooted in Chapter Three. This was due to McFetridge and Boer and Lycan, and articulated the idea of a "proposition by proxy" in terms of display sample and linguistic role.

An important feature for us of Burge's account is that it attempts to capture the fact that the de re/de dicto distinction cannot always be given in terms of substitutivity. The idea behind the account is similar to the one which we shall employ in rendering the expressions of intention and action. The problem sentence which is taken to illustrate the characteristic of de re/de dicto belief in which we are interested is:

(10) Alfred believes that the man in the corner is a spy.

Here, we may suppose that Alfred's belief involves thinking of the fellow as the man in the corner and not as, say, the first-born in Kiev in 1942. But we may also intend our

ascription to relate Alfred to the man to whom we refer with "the man in the corner". In other words, the term "the man in the corner" is doing double duty at the surface level: both characterising Alfred's conception and picking out the relevant "res". We may paraphrase as follows: Alfred believes that the man in the corner is, qua man in the corner, a spy. This reading of the sentence goes over, on Burge's analysis, as:

(11) B_r(Alfred, <the man in the corner>, ⌜Spy([y](Man(y) & InC(y))⌝)

(The final relatum says something like "the object which is a man in the corner is a spy"; "B_r" signifies de re belief as opposed to de dicto belief.) It is remarked that de re locutions are about predication broadly conceived - they describe a relation between open sentences (or what they express) and objects [1].

The idea that certain expressions do "double duty" will be necessary to account for the behaviour of adverbial modifiers. In the same way as "the man in the corner" did double duty in what it characterised, descriptions under which actions fall appear first to describe the action in question and also to be involved in the characterisation of the adverbial modification that "subsequently" takes place. It is also noticeable that our paraphrase of (10) seemed to require that we acknowledge the idea of a "qua-object" (c.f. discussion of Castaneda).

2.3. A combined analysis

There has been a proposal to combine the insights of the analyses of Castaneda and Burge (Baker and Wald 1979). The idea is to accommodate sentences like (4) which, on Castaneda's analysis, have the form of (6):

(4) Smith believes that he (himself) is healthy.

(6) Smith believes that he* is healthy.

As we have remarked, Castaneda has argued that "he*" as it occurs quasi-indexically in (6) is unanalysable. Using this as a clue, Baker and Wald suggest that we retain Burge's analysis and adopt "he*" as a primitive - that is, it is a predicate representing a

[1] The other reading of (10), in which the notion of a man in the corner is not attributed to Alfred, is:
B_r(Alfred, <the man in the corner>, ⌜Spy(y)⌝)

characteristic function where "he*" is true of an object if the object is self-aware, and false otherwise. Using this idea, the distinction between (4) and

Smith believes that Smith is healthy.

can be represented as follows (where (12) corresponds to (4)):

(12) B_r(Smith,<Smith>,⌜Healthy[y]he*(y)⌝)

(13) B_r(Smith,<Smith>,⌜Healthy[y]⌝)

The antecedent to the truth conditions will contain the conjunct "y=Smith". (Burge and others employ terms in angle brackets for de re readings; in the interests of clarity, we shall not follow their example in the following initial representations. They may be introduced as appropriate at a later stage.) The close connection between (4) as represented by (12) and Smith's first person belief, "I am healthy", is indicated by the singular term "[y]he*(y)". We shall require the services of this device in our treatment of intentional constructions.

3. Treatment of Target Expressions

This section contains what may be described as proposals for the logical forms of the constructions under consideration. The resulting representations will draw upon ideas and apparatus presented earlier, such as the employment of Burge's corner-quoted expressions rather than Davidson's parataxis.

3.1. By

It would be as well to start off with our proposed treatment of the adverbial expression which was seen to be important and fundamental in recent theories of action. The problem raised by Hornsby for our earlier suggestion can be illustrated once more with an example. Consider the following characterisation of the action of a traffic warden:

a. Smith endangered his chances of promotion.
b. Smith caused an accident.
c. Smith stopped oncoming traffic.
d. Smith signalled.
e. Smith raised his arm.

From this we may construct the following "by" sentences:

A. Smith endangered his chances of promotion by causing an accident.

B. Smith caused an accident by stopping oncoming traffic.

C. Smith stopped oncoming traffic by signalling.

D. Smith signalled by raising his arm.

What we want our analysis to avoid is a result like

(14) Smith signalled by stopping oncoming traffic.

which would be the result of an analysis that construed "by" as a relation between an action and one description under which it could fall. The method of representing "by"-sentences that we have chosen does not commit us to sentences like (14). Instead, by acknowledging two descriptions rather than one, we obtain, at the worst, something like this:

(15) Smith signalled, and that action, in the capacity of a causing of an accident *(qua* causing an accident), was performed by stopping oncoming traffic.

The above sentence may seem a little long-winded, but it merely spells out one of the central ideas of our action theory and we are able to make sense of it. Furthermore it is not equivalent to (14) and does not represent an unwelcome result. In other words, our own conception of a qua-action defuses the problem. With this in mind we can go on to attempt a representation of sentence D:

(16) $(\exists e)[Signal(e,S) \ \& \ By(e,S,\ulcorner Signal(x,y)\urcorner,\ulcorner Raise(x,y,arm)\urcorner)]$

(Notice that, in (16), the open sentence-description does double duty in initially characterising the action and then characterising the behaviour of "by".) In addition, we may represent sentence (15) as [2]:

(17) $(\exists e)[Signal(e,S) \ \& \ By(e,S,\ulcorner Cause(x,y,accident)\urcorner,\ulcorner Stop(x,y,traffic)\urcorner)]$

In both (16) and (17) two of the argument places of "By" are taken up with the event (the conjunctive analysis is retained — in this sense, "by" is just like other adverbials) and the

[2] I have construed the verb "cause" in this way for the sake of convenience, not because I wish to adopt a theory of agent causation.

agent. When we talk of "by" as a relation between an action and two descriptions, we mean that those descriptions would be "satisfied" by the event and the agent. It is not clear whether we should allow the descriptions to have three free variables in the case of "by" (this is not possible in the following case of "in order to") — I have assumed that the "extensionality" of agent and event is not present for the third argument place. In the following treatment of other adverbs, it will become clear that the characteristics of conjunctive analysis and redescription are to be retained throughout. In this way, it is hoped to show that, in virtue of their behaviour in logical form, adverbs form an identifiable class of expressions.

The treatment of "by" that we have proposed has not covered one case in which our theory seems to say that more than one action is involved. This is illustrated by the following example. Suppose that I am a member of a gang carrying out a bank raid. My job is to stand outside the bank and signal to the getaway driver when the raid has gone according to plan. The arrangement is that I will cough and wink if the raid has been successful, and simply wink if something has gone wrong. So, if all goes well, I signal by winking *and* coughing. Just doing one of these is not enough.

This sort of example seems to involve more than one distinct act: a winking and a coughing (at least). Even with our broad notion of "bodily movement" the winking and coughing seem to be separate. This may be thought to cause a problem for our contention that "by" involves one action-event falling under two descriptions. However, there is a way to circumvent this difficulty. The idea is that we allow that certain successions or sequences of acts (bodily movements), which may have individual descriptions, can fall under one description. What this amounts to is an account of action summation based on "by". (The idea of a number of bodily movements falling under a single description could also arise in connection with the next expression to be considered, "in order to".) If an agent f-ed by x-ing & y-ing & z-ing, then the last three actions amount to one act of f-ing. Regimentation of the sort of sentence involved would go something like this (using the bank raid example):

$$(\exists e)(\exists f)[\text{Signal}(A,\langle e,f\rangle) \;\&\; \text{By}(A,\langle e,f\rangle,\ulcorner \text{Signal}(p,x)\urcorner\ ,\ \ulcorner \text{Wink}(p,y) \;\&\; \text{Cough}(p,z)\urcorner\ )]$$

where the angle brackets signify a sequence of acts, amounting to one action. The sort of action composition that I have in mind is quite different from Taylor's proposal for event summation (Taylor 1985). He suggests that one of the principle conditions for summation of subevents is that they exemplify a common property. Of course, our suggestion in terms of "by" does not make any such requirement, and yet we still wish to say that some sort of

composition or summation takes place. This is not to say that Taylor has the wrong method of composition and we have the right one. As I have indicated earlier, there may well be more than one way of combining actions and events harboured within sentences of English.

Comments have been made in earlier chapters suggesting that part of the "esse" of actions, as opposed to "mere" events, is their participation in the "by"-relation (or whatever "by" expresses in our characteristic examples). This judgement may throw doubt upon certain suggestions regarding the "species" of events ("eventualities") acknowledged by natural language. For example, Parsons discriminates between events and states (Parsons 1980, Parsons 1985).

John believes that snow is white.

is thought to report a state (Parsons 1980: 45), as is the following sentence (Parsons 1985: 238):

Agatha is a doctor.

Prima facie, there is a difference between the two examples which is expressed in our framework: in the underlying representation, the former would involve quantification over an "eventuality", whereas the second simply involves predication on an individual. Regarding the first example, Parsons says, "I am saying that John is in a certain state, *not that he acted in certain way*" (my emphasis). This seems to be correct, but it might be argued that the "by"-locution, which is associated with ascription of agency, suggests otherwise. For example, suppose that Smith is a bright student who irritates his tutor because he always knows the answer to difficult questions. On one occasion, the tutor decides to present his students with a particularly tricky question. However, on this occasion as well,

Smith angered his tutor by knowing the answer.

I would suggest that this sort of example is misleading, and retain the idea that knowing is a state. The above sentence seems to be a shorthand way of expressing the idea that Smith angered his tutor by making him aware of the fact that he knew the answer. A more natural way of saying the same thing would be something like "Smith's tutor was angry because Smith knew the answer".

3.2. In order to

As well as the above adverbial (which we may note did not require the use of all the resources mentioned in previous sections, since, significantly, there does not seem to be a first-person element involved in doing one thing by doing another) there is another, apparently related, expression which connotes complex activity. It would be useful to introduce this adverbial by making a comparison with the "by"-adverb. Consider the following "chess match" example:

a. Smith won the contest.
b. Smith checkmated Brown.
c. Smith moved his queen.
d. Smith frightened a fly.
e. Smith moved his arm.

From our previous discussions, it is clear that a number of "by"-sentences can be constructed. In addition, sentences of the form "A x-ed in order to y" are also in the offing. In fact, at first blush it looks as if the "in order to"-adverb creates expressions which are the mirror-image of those pertaining to the "by"-adverb. For example, we have:

(18) Smith checkmated Brown by moving his queen.

(19) Smith moved his queen in order to checkmate Brown.

However, we are not always entitled to make this sort of transformation. An example derived from the above action descriptions will allow us to see this. We can say

(20) Smith frightened a fly by moving his arm.

but not

(21) Smith moved his arm in order to frighten a fly.

because it was simply a "side-effect" of Smith's arm-movement (queen-moving) that the fly was frightened. In other words, during the chess match, when Smith moved his queen (i.e. when Smith moved his arm) he *happened* to frighten a fly; he certainly had no "intention" of doing so. All of which should encourage us to drop the idea of representing "in order to" in terms of "by", since one is clearly not the mirror-image of the other.

There is, however, another reason to reject this sort of approach. In the case of "by" we saw no need to include in our representation anything corresponding to the notion of a first person element. "By"-sentences do not seem to invoke this idea. When proposing a treatment of "in order to" we should note that intention is imputed to the agent; the presence feature is is the reason why "in order to" is not a mirror-image of "by". The difference between the two is therefore one of intention. The intention with which an agent performs an action in order to do something suggests that an irreducibly first person element is required for a satisfactory representation. We may always paraphrase the behaviour of "in order to" in terms of the theory of action to which we subscribe: A x-ed, and his action, qua x-ing, was performed in order to y. Once more, the adverb takes as two of its relata the descriptions under which the action falls — we are not acknowledging that two distinct actions have been performed. (In a subsequent subsection we shall consider a sense of "in order to" which recognizes two actions.) In the light of the preceding remarks it is possible to suggest the following representation of an example sentence, "Smith winked in order to signal" (or, "Smith winked in order that he* signal"), where the adverb is abbreviated to "IOT":

(22) $(\exists e)(\text{Wink}(e,S)\ \&\ \text{IOT}(e,S,\ulcorner \text{Wink}(x,[y]\text{he*}(y))\urcorner\ ,\ulcorner \text{Signal}(x,[y]\text{he*}(y))\urcorner))$

In (22) the singular term involving "he*" has been used to accommodate the first-personness of "in order to". It is present in both descriptions of the action because I tend to think of the intention present in the agent's action as "spreading" from the action performed to the action that is "intended" (c.f. Davidson's idea of agency spreading from primitive actions to actions described in further ways (Davidson 1971: 52)). We might say, albeit rather clumsily, that the agent has an intention of making his action fall under another description.

This is a good place to anticipate and answer an objection to the proposed treatments of "by" and "IOT". It might be claimed that the form of (16) which exhibits the behaviour in logical form of "by" is unsatisfactory because it does not allow us, as it stands, to infer directly from

A x-ed by y-ing

that A y-ed. We should, the objection might run, be able to conclude (as a matter of logical form), from hearing that someone did something by doing something else, that he did the something else. In response to this we may first observe that the way in which expressions behave at the level of logical form does not always mesh with our intuitions

about "felt implications". And in deference to Davidson's ideas about the holistic treatment of language we must pay attention to a number of possibly related examples (c.f. our problem family) in order to draw conclusions about the "logic" of the expressions under study — what should emerge is an idea of "how much of logic to pin on logical form". Regarding these points I would like to suggest that "by" and "IOT" behave in the same sort of way in logical form (except for the first person reference in the latter). In the same way that we cannot conclude from the logical form of "A x-ed in order to y" that A y-ed, the representation of "by" does not allow the sort of inference alluded to above. The situation is similar to the one involving the verbs "believe" and "know": no attempt is made (at least in a Davidsonian framework) to account for the fact that if you know that p, then p. In other words, the predicates corresponding to these verbs exhibit the same behaviour in logical form. I suggest that the same applies to the predicates corresponding to the adverbs that we have been discussing. This is not to say that there is absolutely no way of obtaining the desired inference, and therefore no method of drawing a distinction in this manner. We could, for example, simply say that there is something like a meaning postulate on "by" which is not on "in order to". However, it is not our intention here to judge the propriety of such a manoeuvre. (See also Chapter Four.)

3.3. Intentionally and Intends

We have remarked in Chapter Five the distinction between doing something intentionally and intending to do something. The difference will be reflected in the distinct logical form proposals for the adverb and the verb. It is worth mentioning here that the latter point regarding distinct logical forms is not endorsed by Davidson. In his most explicit presentation of his views upon this topic (Davidson 1985b: 235), he suggests a parallel between the following pairs: necessarily-possibly, knowing-believing, intentionally-intending to. In each case, he points out, the first concept has an implication which the other lacks. Such a difference is put down to analysis of particular concepts; it is not thought to be in the province of a theory of logical form. On this occasion I do not support Davidson's argument. First, it should be pointed out that the above pairs are not comparable: the first is a pair of adverbs, the second a pair of attitude verbs, and the third an adverb and an attitude verb. We would expect different parts of speech to behave differently. Second, the first pair are sentence adverbs, whereas "intentionally" is a "subject oriented" adverb. We do not have much to say about sentence adverbs, but it is reasonable to suppose that they do not receive the same sort of representation as other adverbs which will receive a conjunctive analysis. In other words, Davidson's remarks do not endanger the distinction put forward in the preceding chapter.

Our present concern is primarily with getting the logical form of certain adverbs straight, but in the present case it is interesting to provide a treatment of a cognate verb. The verb seems to be central to our ascriptions of sophisticated activity. It is clear, I think, that both adverb and verb require acknowledgement of first person reference and thus provide occasions for the employment of the Castaneda-Burge predicate "he*".

The verb "intends" will be considered first. Taking a sentence like "Smith intended to signal" we require, on a Davidsonian interpretation of verbs, that there a be a third argument place in the appropriate predicate for an event variable [3]. With this in mind, we obtain:

(23) $(\exists e_1)\text{Intend}(e_1,S,\ulcorner(\exists e_2)\text{Signal}(e_2,[y]\text{he*}(y))\urcorner)$

In contrast, the proposal for the adverb "intentionally" is that a sentence like "Smith signalled intentionally" goes over as

(24) $(\exists e)[\text{Signal}(e,S)\ \&\ \text{Intentional}(e,S,\ulcorner\text{Signal}(x,[y]\text{he*}(y))\urcorner)]$

A number of comments are appropriate. It is noticeable that the verb in (23) has as its content something like a "proposition" (a closed sentence, at any rate). In common with the propositional attitudes it expresses an attitude towards a proposition. From (23) we cannot infer that Smith signalled; this is in agreement with our earlier discussions of intending. In contrast to (23), (24) entitles us to conclude that Smith signalled: this agrees with our comments on "intentionally" — we can obtain an adverb-dropping inference. However, it is not from the form of the adverb that we arrive at the entailment: it is due to our retention of the conjunctive analysis of adverbs. Sentence (24) might be thought of as saying something like: Smith signalled and the action, described as a signalling, was intentional. In this way we articulate the notion of an action being intentional only under a description. We could imagine a modification to (24) which expressed the fact that Smith stopped the traffic, but his action was only intentional *qua* signalling. Such comments are reminiscent of some of Lemmon's remarks (Lemmon 1967). He points out that we would like to be able to use the expression "intentional of x that p" in such a way that it does not entail p — "in other words in such a way that p describes what x meant to achieve (if anything) rather than what he *did* achieve" (p.102). So, in common with most other adverbs, "intentionally" licenses an inference which is not consequent upon the adverbial

[3] Note that I do not stipulate that the verb is an "action verb" — it is not at all clear that we would want to say that intending is an action.

predicate itself.

Another important difference between (23) and (24), which is not immediately obvious, concerns the role that the event variable plays in each. In (24) it allows a paraphrase about an action of Smith's being intentional under a certain description: we are concerned with Smith's action. On the other hand, the event variable in (23) ("intends") is there because we are adopting a Davidsonian reading of verbs. We are paraphrasing "Smith intends..." as "There is an intention of Smith...". In so doing we are acknowledging, with our event variable, an "intention". This semantic characteristic is in accord with our earlier speculation that the notion of intending to act also involves the notion of an intention (a "prior intention").

Proposals for the accommodation of attributions of intentional action using "intentionally" in a broadly Davidsonian framework have recently been put forward by Louise Antony (Antony 1987). There are certain similarities between her account and our own. She construes attributions of intentional action, and accordingly the representation of "intentionally", as expressing a relation between agents, events, and descriptions. Also in common with us, she is wary of approaches to "meaning" and couches her discussion in other terms. However, there are significant discrepancies between the two accounts.

Antony proposes that the "description", or third relatum, in the intentionality relation is "a mental state — a belief, or the complex mental state composed of a belief and a pro-attitude that Davidson terms a "primary reason"" (Antony 1987: 315-316). This approach draws upon Davidson's earlier work on actions, reasons and causes (Davidson 1963). The action-specification to which the attitudes are directed is a mental representation which is introduced using a function from public language expressions to internal representations; the function is an idea borrowed from Fodor (Fodor 1978). These notions are employed in the representation for sentences containing "intentionally", with the result that the "logical form" of such sentences does not include a predicate directly corresponding to the adverb, but includes a complex clause involving the agent's mental representation, belief and desire. We have labelled approaches like this "decompositional" and have suggested that the projects of providing logical forms and doing analysis of individual predicates have been conflated. Our own approach does not exhibit this feature. In addition, unlike Antony, we do not introduce mental representations directly into logical forms to "characterize [the agent's] state of mind" (Antony 1987: 315). However, by invoking the idea of "proposition" (or propositional component) in terms of conceptual role, we would have a way of accommodating this feature of attributions of intentional action that Antony wishes to account for.

In this subsection we have described the behaviour of the clearest example of an intentional adverb, "intentionally". However, there are others, such as "deliberately",

"painstakingly" etc. These, I think, would follow the pattern of "intentionally". An adverb, which may be conceived of as intentional and which has been thought to pose a problem for a theory of adverbial modification, is "reluctantly". A sentence like

Reluctantly, John bought gas and had oil changed.

may require that John was reluctant to perform *both* actions, even though he would be happy to perform one or the other. I would suggest something like the following as an underlying representation for this reading:

$(\exists e)(\exists f)[Buy(e,J,gas)\ \&\ Change(f,J,oil)\ \&$
$Reluctant(\langle e,f\rangle,J,\ulcorner Buy(x,[y]he^*(y),gas)\ \&\ Change(z,[y]he^*(y),oil)\urcorner)]$

where the angle brackets signify an ordered pair, and the corner quotes enclose two open sentences which correspond to the pair of distinct events.

In addition to being intentional, "intentionally" is intensional like the problem adverb "allegedly". It is not possible to treat "allegedly" along the lines of "intentionally" or any other adverb which receives a conjunctive analysis. "Allegedly" differs from "intentionally" and other intentional adverbs in that it does not have associated with it a cognate verb which differs in sense from it (c.f. "intentionally"/"intends"). Another way of separating intentional adverbs from merely intensional ones is to abide by the classification drawn up by Jackendoff, who would place intentional adverbs among subject oriented abverbs. "Allegedly" does not belong to this class. The same sort of point has been made in different ways. According to Katz, "intentionally", like all intentional adverbs, "operates on noun phrases that specify the agent" (Katz 1987) or, as Davidson would have it, it bears a special relation to the belief and attitudes of the agent. We shall not attempt to represent "allegedly" in what follows.

An intentional adverb which crops up a lot in criticism of Davidsonian theory is "painstakingly". As I suggested it can be accommodated in the same way as "intentionally" so that we can say of someone that he painstakingly wrote slowly — "writing slowly" is the description under which the action is painstakingly performed. However, I think it would be correct to say that there is a distinction between "painstakingly" and "took pains to" which is parallel to the "intentionally"/"intends" distinction. Although an attribution of the form "x f-ed painstakingly" allows us to conclude "x f-ed", saying that an agent took pains to do something does not require that the agent was successful. In view of this, a separate logical form can be assigned to the verb along familiar lines.

3.4. FPO and BY

In earlier subsections, proposals were made concerning the representation of "by" and "in order to" in which those adverbs were seen as principally expressing relations between an action and two descriptions. There appear to be uses of these expressions which are not done justice by the earlier proposals. Some examples should make this more obvious.

On occasion one might say that someone did something by doing something else when it is not clear that our underlying view of actions would allow us to say that we were acknowledging that one action bears a certain relationship to its descriptions. Such occasions seem to involve consideration of two distinct actions. For example:

(25) Smith contacted Brown "by" consulting the telephone directory.

Sentence (25) appears to acknowledge two action-events (even under a Davidsonian view of action which has it that actions are just bodily movements): Smith contacting Brown (telephoning him) and Smith consulting the directory. It is not the case that we are simply dealing with a matter of description. We seem to have to allow for a reading of "by" (which will be signified by "BY" henceforth) which expresses a relation between two actions. The question now arises of whether "BY" expresses a relation between "actions-under-descriptions", or whether it is more like the causal relation which simply has argument places for events. Regarding its extensionality, I would suggest that the latter form is more appropriate: what seems to be expressed may be paraphrased by some as an "enable" relation which connects actions however described. There seems to be no need to take account of intention in this case, nor is there reason to suppose that there is an irreducibly first-person element which should be accounted for. We might paraphrase (25) as "Smith's consulting the directory enabled him to contact Brown". With this in mind, we could propose the following as underlying (25):

(26) $(\exists e)(\exists f)[\text{Contact}(e,S,B) \ \& \ \text{Consult}(f,S,\text{directory}) \ \& \ \text{BY}(e,f)]$

In addition to "BY", there is, I think, a requirement for another version of "IOT" which we shall call "for the purpose of" and abbreviate as "FPO". We can illustrate its use with a modification of (25):

(27) Smith consulted the directory "for the purpose of" contacting Brown.

I suggest that "FPO" in sentence (27) is unlike "BY" in sentence (25) because, although it involves two distinct actions, it does so by acknowledging that they fall under certain descriptions. The actions are distinct, from our point of view, for the same reason as they

were in the preceding example. The purposive element in (27) is associated with the employment of the notion that an action can only be intentional under a certain description: the action is performed, *qua* such-and-such a description, for the purpose of performing a distinct action. Once again, since the agent's intentions are involved, we may require that first person reference be represented. A suggested underlying representation for (27) is:

(28) (∃e)(Consult(e,S,directory) & FPO(e,S, ⌜Consult(x,[y]he*(y),directory)⌝ , ⌜(∃f)Contact(f,[y]he*(y),B)⌝)

What we end up with here is really a relation between an action, its accompanying description, and another-action-falling-under-a-description (a closed sentence). The expression "FPO" displays the features of both an adverb, doing a job of description, and an attitude verb, having a content. In view of this, it would not be correct to say that FPO is simply an adverb. With BY the case for its not being an adverb is even clearer: there is no action redescription involved in its representation at all.

3.5. Refrains

Having given an account of what refraining might be, it would be interesting to see whether we can accommodate something as problematic and anomalous as "refrains" within our theory. First of all, we must observe our distinction between the analysis of individual predicates and questions of logical form: we are not going to decompose "refrains" into "intentionally" and "intends" and plug the latter two expressions ("primitives" or "syntactic simples") into our logical form. However, our earlier discussion of refraining, which did employ the verb and adverb of intention, gives us a clue to the representation of "refrains": we may need to treat it as exhibiting features characteristic of both verbs and adverbs, while retaining the "refrains" predicate. Our consideration of this particular verb requires it to behave differently in logical form from, say, verbs of propositional attitude, which might be thought to have a similar representation. To illustrate this we consider the sentence

(29) Smith refrained from coughing.

which, I suggest, has something like the following underlying form:

(30) $(\exists e_1)[\tilde{}\,\text{Cough}(e_1,S)$ & $(\exists e_2)\text{Refrain}(e_1,e_2,S,$ ⌜(∃f)Cough(f,[y]he*(y))⌝ $)]$

Here, the conjunctive analysis of adverbs is present, and is due to the element of "refrains" which is associated with "intentionally". It allows us to conclude, from "Smith refrained from coughing", that Smith did not cough, or that whatever Smith did it was not coughing. This latter point is reminiscent of our discussion of the phenomenon of "displacement refraining", in which the the agent does *something*, but does not perform the action refrained from. "Refrains" also acts like a verb, inasmuch as the predicate has as its content a "proposition" and not an open sentence (c.f. "intends"); the element of redescription is not contained in the predicate. In (30), I have included an event, e_2, in order to represent the notion that refraining involves an attitude (cf. intending) towards an action. I do not feel so confident about construing a verb like "knows" in such way to allow us to say, as a matter of logical form, that, if John knows that p, then p. This is because there is no evidence that this verb of propositional attitude exhibits features more commonly associated with two different parts of speech.

3.6. Other Constructions

This final subsection is concerned with expressions pertaining to human action which have not so far been covered, some of which have been thought worthy of special attention in the literature on action sentences and adverbial modification. First of all, I would like to comment briefly upon the possibility of accommodating attributive adverbs like "slowly" within our framework, and suggest how we could defuse Wallace's problem.

The example that will be taken to illustrate the treatment of attributives is:

(31) John shouted loudly.

In order to represent (31) it would be useful to paraphrase it as: There was a shouting by John and it was, qua shouting by John, loud. What is loud is an action under a description. This is not analogous to intentional adverbs because "loudly" does not operate on the noun phrase specifying the agent, nor does it involve first-person attribution. Implementing these ideas, we get the following as the underlying representation of (31):

(32) $(\exists e)(\text{Shout}(J,e)\ \&\ \text{Loud}(e,\ulcorner\text{Shout}(J,y)\urcorner))$

In other words, "Loud" is a two-place predicate having as a arguments an event and a description under which that event falls. An action is therefore not loud simpliciter, while at the same time we may infer from "John shouted loudly" that John shouted; we can also infer that an event, which was loud for a shouting of John, occurred. Presumably, it would

be possible to alter the description to allow for a sense of (31) in which John's shouting is loud for any shouting, not just John's. This final comment needs some elaboration. What I am suggesting is that the description of the action which is associated with the adverb (the "qua-phrase") need not be determined by the predication on the agent-phrase. This is in accord with observations made by Siegel on a seemingly related class of expressions, adjectives (Siegel 1979). It is pointed out that the relativity of measure adjectives like "fast" is not relativity to the meaning of the modified common noun. No doubt the same may be true of adverbs. There are likely to be other nuances of attributive adverbs to which the present, rather jejune, way of accommodating this sort of adverb is not sensitive. However, since this is not the principal aim of the project we shall have to rest content with such an indication.

Although the above comments do not do justice to the topic of attributivity (perhaps because, in pursuing a Davidsonian project, our results are bound to seem modest) or to the amount of work which has been put into accommodating this phenomenon, it would be interesting to turn to another contribution, by Wallace, if only to delineate the sort of proposals that we have in mind more clearly (Wallace 1971, Wallace 1972). Wallace is eager to represent logical relationships between positive, comparative and superlative forms of adjectives (and adverbs), e.g. "large", "larger-than" and "largest". So, a sentence like "Jumbo is a large elephant" is thought to express a relationship between Jumbo, "larger than" (a relation) and "being an elephant" (a property). I have avoided making this sort of claim, because I see no reason to relate the expressions "logically": each expression, or syntactic simple, just finds a corresponding expression in logical form. We are familiar with warnings not to "misuse" meanings of individual predicates.

In addition, Wallace is anxious to "explain" patterns of reasoning like the following (Wallace 1971:706):

Jones hit Smith hard.
Brown hit Smith harder than Jones hit Smith.
So, Brown hit Smith hard.

Once again, we have not attempted this sort of thing — Wallace manages it by utilising the "logical" relations discussed above, and by invoking a principle which involves satisfaction of attributes by sequences of objects [4]. The latter leaves us in doubt about whether

[4] In all his dealings with phenomena of adverbial modification, Wallace uses attributes obtained by intensional abstraction where we might use corner-quoted open sentences. His proposal for "Jones intentionally kicked Smith" is:
$(\exists x)(\mathrm{Int}(J, \langle J,x\rangle, \mathrm{ab}[\mathrm{kicked}(a,S,b)])$
which, together with the following principle, allows us to infer that Jones kicked Smith:

explanation of the inference is at the level of object-language or meta-language.

No doubt, we could license the inference in some way, but, as Davidson says:

> Plenty of inferences that some might call logical cannot be shown to be valid in any interesting way by appeal to a theory of truth, for example the inference to "a is larger than c" from "a is larger than b and b is larger than c" or to "Henry is not a man" from "Henry is a frog". (Davidson 1980:143)

In order to avoid what we have called Wallace's problem for a sentence like

(33) Smith pocketed the 8-ball into the side.

we provide something like the following logical form:

(34) $(\exists e)(\text{Pocket}(e,S,8) \ \& \ \text{Into}(e,\text{side},\ulcorner \text{Pocket}(x,S,8)\urcorner))$

This representation avoids the problem (of pocketing the wrong ball into the side pocket) in a similar way to our proposal for the objection brought by Hornsby.

I would now like to turn to some examples of problem adverbs mentioned in Chapter Two. They are representatives of a class of adverbs labelled "subject oriented" by Jackendoff (Jackendoff 1972). We have already come across some examples of adverbs which have been thought of as subject oriented, e.g. "intentionally", and "deliberately". Characteristically, they permit paraphrases of the following form (where "ADV" signifies the adverb minus the "-ly"):

It was ADV of A to x.

The adverbs that I am concerned with now allow this paraphrase, but usually have homonyms which are manner adverbs. This phenomenon, or something like it, was noticed by J.L. Austin and is sometimes known as "Austinian ambiguity" (Austin 1970). More recently, McConnell-Ginet (McConnell-Ginet 1982) has considered the same phenomenon,

---

$(\forall x)(\forall y)(\forall P)(\text{Int}(x,\langle x,y\rangle,P) \rightarrow \langle x,y\rangle \text{ satisfies } P)$

in distinguishing between the following:

a. Louisa rudely departed.
b. Louisa departed rudely.

She says (McConnell-Ginet 1982: 161) that the adverb in b. assesses the manner of the action, whereas a. expresses some judgement about the import of the action. Concentrating on a. (the non-manner reading), this reminds me of what Davidson has to say about the treatment of "intentionally" in contrast to other adverbs, and leads me to think that the treatment of "intentionally" and "rudely" (as it appears in a.) would be along similar lines. As a result, the logical forms of sentences like a. and b. would be different.

Davidson makes the following points about intentional adverbs (mainly at the end of "The Logical Form of Action Sentences" (Davidson 1967a)):

1. Intentional actions are not a class of actions, or, to put the point a little differently, doing something intentionally is not a manner of doing it.

2. To say that someone did something intentionally is to describe the action in a way which bears a special relation to the beliefs and attitudes of the agent.

3. When we think of an intentional act, it is important not to think of the intentionality as adding an extra doing of the agent.

4. Adverbs which impute intention operate on noun phrases that specify the agent.

As we have seen, an analysis of "Caesar crossed the Rubicon intentionally" would start off from the paraphrase:

It was intentional of Caesar that he* crossed the Rubicon.

where "he*" is Castaneda's "quasi-indicator" which signifies the irreducible first-personness of what was done intentionally.

The above points 1., 3., and 4. seem to apply to "rudely" in a., but point 2. does not have direct application. The paraphrase of a. (and resulting logical form) will be like that of "intentionally" except for one feature. We can paraphrase a. as follows:

It was rude of Louisa to depart. or
It was rude of Louisa that she departed.

Here there is no need for a quasi-indicator, since there is no irreducibly first-person

element — we are talking about a judgement of the action, not an "intention". Accordingly, the underlying representation of the non-manner sense of "rudely" would be along the lines of "intentionally", but without the feature of first-personness. As a first step:

(35) (∃e)[Depart(e,L) & Rude(e,L,⌜Depart(x,y)⌝)]

Should it be objected that this sort of thing results in "rudely" having two "meanings", our reply is that "rudely" can make two different sorts of contribution to the semantics, or truth-condition, of a sentence. If this is what is meant by "meaning", the assignment of different logical forms in different circumstances is unsurprising. I suggest that adverbs like "wisely" and "bravely", identified by Richards as having two readings (Richards 1976), should receive the same sort of treatment as "rudely".

Before concluding the chapter, I would like to turn to another recent modification of the Davidsonian approach to adverbial expressions which is due to David Widerker (Widerker 1988). He proposes a treatment of prepositional phrases which, we are to infer, generalises to other classes of adverbs. The motivation for his account comes from the observation that prepositional phrases are as troublesome as attributives for the sort of account put forward in Davidson's "The logical form of action sentences": they seem to apply to an event only under a certain description. In this respect, we have already remarked the problem brought up by Wallace. Widerker rejects a number of approaches before proposing his own. For example, Wheeler's account of attributives (Wheeler 1972) is judged to be unacceptable due the extensionality which accompanies his use of reference classes (Platts makes the same point (Platts 1979)). Widerker's account involves treating (prepositional) adverbs, not as event predicates, but as unanalysed parts of action verbs. The example of John buttering his toast in the kitchen with a knife goes over as:

(∃e)[Butter(e,J,the toast) & Butter-In(e,J,the toast,the kitchen) &
Butter-With(e,J,the toast,the knife)].

It is true that such a manoeuvre does not commit us to unwelcome consequences like "John pulled the trigger with a revolver", but the avoidance of such results comes at a price. By cementing verbs and adverbs together in this way, the account obscures structure which should be articulated at the level of logical form. Davidson, in "On Saying That", rejects Quine's treatment of oratio obliqua (in terms of a one-place predicate) for the same sort of reason. Apart from burying the common element of similarly modified sentences within the verb predicate, Widerker's proposal multiplies the number of predicates which are in the language. Although I take it that Widerker's analysis is supposed to generalise to

adverbs like "slowly", it is not clear how the proposal would cover intentional and subject-oriented adverbs. Since these are among the target constructions which it has been our task to accommodate, Widerker's proposals will not influence the suggestions made earlier.

The proposals presented above, while no doubt being incomplete in some ways, have shown that we have the resources to represent an interesting and important class of expressions. In this respect, we could augment our earlier representations to bring them closer to ideas suggested by Burge and others. For example, instead of (24), we could construe "intentionally" as follows:

$(\exists e)[\text{Signal}(e,S) \ \& \ \text{Intentional}(S,\langle e,S\rangle,\ulcorner\text{Signal}(x,[y]he^*(y))\urcorner)]$

Such a move retains the insights of our discussion of action, and may be adopted for other expressions.

Conclusion

The suggestions made in the preceding sections articulate ideas, which have resulted from the considerations of earlier chapters, about the gamut of ascriptions of complex and purposeful action. The theoretical commitments arrived at from our earlier discussion of action have been made clearer and are better articulated as a result of actually doing semantics. The next stage is to employ the theoretical insights we have gained and the view of human action that we have arrived at to inform an examination of the treatment of action in Psychology and Artificial Intelligence, where the representation of action and intention is an important issue. (This is in accord with the discussion at the end of Chapter One.) The result is an interdisciplinary perspective on the study of action. This will be the topic of Chapter Seven.

CHAPTER 7

An Interdisciplinary Perspective

Introduction

This chapter is principally concerned with representations of actions, and with theories of our understanding of human action. It is argued that the form which has usually been associated with such representations in other disciplines is not the only, nor even the best one. In addition, alternative proposals are made regarding these structures and the relations which are thought to be required for their construction. In this way, a more sophisticated theoretical apparatus and an enlarged conceptual repertoire can be brought to bear upon the study of action. The examination and comparison will result in our being able to present a shift in perspective. The chapter is divided into four sections, whose arrangement and content are as follows.

The object of the first section is to recapitulate proposals made so far regarding our theory of action and action language. It turns out that the view which we have advocated is somewhat different from the perspective which is usually implicit in work on the representation of action.

The second section contains a presentation of a number of recent and influential theories: due to Schank and Abelson, Schmidt et al, Rumelhart, Lichtenstein and Brewer, and Foss and Bower. There have, of course, been many more contributions to the area that we are concerned with than this, but we shall restrict ourselves to the consideration of the more prominent and representative ones. The theories discussed make claims about the representation of, for example, observed action, actions acknowledged in narratives, and an agent's own action; the present chapter is concerned with general claims about the representation of action. The accounts presented in this section do not match up well with the summary of theoretical considerations presented in the first section. They cannot be construed as implementations of the theory which we have adopted, and they are limited in the range of phenomena that they can represent.

In the light of the animadversions of the second section, the third section presents the first steps towards an alternative picture of action representation, which does not make explicit use of goal-subgoal relations. It tries to show that "hierarchies" or structures can be built up using the theoretical perspective advocated in the first section. Furthermore, it is suggested that the resulting representations supplement psychological proposals recently made by Vallacher and Wegner.

Finally, the fourth section contains a discussion of the proposals presented and makes some suggestions about directions which further research could take.

1. The Story So Far

In earlier chapters we considered the relative merits of various positions which could be taken on the nature of events and actions. It was concluded that a reductive unifier theory had a number of advantages which other views lacked. In adopting such a theory we gave support to the following ideas:

actions are to be considered as bodily movements which are intentional under at least one description; the cardinal thing in theorising about actions is recognizing that they are capable of falling under a number of descriptions. These, then, are some of the commitments which have been made, and which have accompanied, among other things, the endorsement of a reductive unifier theory of action. What the following sections will show is that our theoretical position yields a number of concepts which are rich and powerful enough to enable us to present the foundation of an "improved" account of action representation. The idea that an action can be interpreted in a number of different ways (i.e. an action has many "meanings") will be important when addressing questions of cognitive representation.

The theoretical discussion of earlier chapters has resulted in a number of well-articulated concepts which we are now ready to put to use in an informed examination of theories within psychology/artificial intelligence/cognitive science. In other words, we are bringing what may be called philosophical considerations to bear upon work in related areas in other disciplines. This sort of project has been attempted before (Carey 1982, Keil 1983). We suggested elsewhere that proposals due to Putnam and Kripke which were subsequently employed by Carey (and others, e.g. Keil (Keil 1983)) made for an uneasy alliance in such circumstances. It is hoped that the stance that we have taken throughout, which is in accord with the view presented in Chapter One, will make for more fruitful collaboration.

In the course of our earlier, semantical work on reports of action and on adverbial modification in general, it was found that, by taking seriously the idea of actions falling under descriptions, a number of interesting relationships could be described. Furthermore, these relationships, which involve the juxtaposition of actions and descriptions, account for a gamut of expressions of purposeful action. By using this idea of juxtaposition, it is possible to classify a family of such reports (for the moment I refrain from giving the treatment of "refrains"). For example, "by" may be thought of as being a predicate which

takes as arguments an action, and the two relevant descriptions under which the action falls. This is a simplified characterisation of the logical form proposal for the adverb "by", which is itself (like the other proposals) a manifestation of our perspective on human action. In this way, we are able to convey the idea that something is performed, qua killing, by shooting. I shall represent "by" in an informal way as follows:

$By(action,description_1,description_2)$

Other action-description relations can be classified in this somewhat schematic way. In this chapter we shall be employing simplified versions of the suggestions made in Chapter Six: for example, the "internal structure" of the descriptions under which actions fall will be suppressed (however, we could regard it as recoverable). As well as killing Brown by shooting him, we might say of Smith, in certain circumstances, that he shot Brown in order to kill him. This we could represent, with the relation abbreviated to "IOT", as

$IOT(action,description_2,description_1)$

As noted before, there is also a relation similar to this one, but which does not express the idea that we "perform an action under one description in order to make that action fall under another description". On occasion we perform an action, under such-and-such a description, "for the purpose of" performing a distinct action (under such-and-such a description). For example, I may pick up the telephone directory "for the purpose of" 'phoning Harry. Here, it is not the case that my picking up of the directory amounts to my 'phoning Harry — even on the action theory I have adopted — for it is possible to discriminate two bodily movements. We could represent the relation, abbreviated to "FPO", intuitively as:

$FPO(action_a,description_a,action_b,description_b)$

The adverb "intentionally" may be treated in a similar way to the other adverbs.

$Intentional(action,description)$

This is supposed to capture the idea that an action is intentional only under a certain description. For example, I may reach over the table to give you the salt, and in doing so may knock over your cup: I pass the salt intentionally, but I knock over the cup unintentionally.

The verb "intends" is considered to be semantically different from the preceding adverb. It is a verb of practical attitude whose use does not guarantee the performance of the action intended. A schematic representation would be something like this.

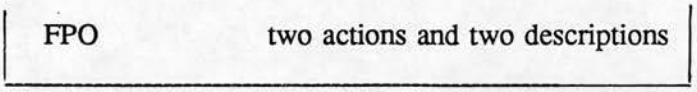
Intend(agent,"proposition")

Finally, it may be conjectured that there is a second form of "by" which stands to that adverb as FPO stands to IOT. It is used to express the idea that my performing one action enabled me to perform another, separate action, no matter what descriptions the actions fell under. We may, on occasion, say that "Harry phoned Tom "by" looking in the directory". This second form of "by", which I signify with "BY", seems to express a relation between two actions, irrespective of descriptions, and may be schematically represented thus:

$BY(action_1,action_2)$

In providing logical forms for the above expressions and for others, it became apparent that such proposals offer only one, perhaps coarse-grained, level of description. Logical forms express the way in which certain unanalysed predicates and terms behave — they describe the "logical behaviour" of such expressions. If we were to decompose predicates into more primitive elements, it is sometimes argued, a finer-grained description would be available to capture those consequences which are not necessarily logical. In this respect, I have chosen a coarse-grained approach (which is in accord with our action theory); a theory of logical form is one sort of description of language — it is a way of revealing the conceptual resources harboured by sentences of natural language. One consequence of this perspective is that adverbs like "by", which are often thought to embody a causal element or primitive, are left unanalysed. The idea that more than one level of description might be available will arise again in the following sections. To conclude this section, the interpretations of some of the adverbial expressions so far mentioned is summarised in the following table. In subsequent sections we shall be making use of this set of relations rather than the full repertoire mentioned earlier and explicitly dealt with in Chapter Six. However, the treatment which will be proposed later on will be able to be extended to incorporate the other relations.

Adverbial relations	Relata
By	action and two descriptions
IOT	action and two descriptions
BY	two actions



2. Theories and Data

In this section I will attempt to outline theories and suggestions which have been the result of recent work on interpretation of action in, what may generally be called, Artificial Intelligence (A.I.) and in Psychology. In addition to this, some comments will be made from a philosophical perspective. It will become clear that most accounts are not strictly comparable with the view of action that we have developed in preceding chapters. This is because the theories to be examined in this section either do not commit themselves to an action theory or, in terms of our classification in Chapter Two, they can be interpreted as endorsing something like a multiplier theory. This sometimes produces a lack of systematicity in their "hierarchies" for representing action. The theories which will mostly occupy us are due to Schank and Abelson, Schmidt et al, Rumelhart, Lichtenstein and Brewer, and Foss and Bower. First, the contributions from A.I.

An attempt has been made by Schank and Abelson to provide a computational model of our comprehension of human action (Schank and Abelson 1977a, Schank and Abelson 1977b). This is still regarded as foundational work for other theories, not only in A.I. (Wilensky 1983), but also in psychology and in attempts to "naturalize" philosophical theories of action (Brand 1984). The ostensive objective of Schank and Abelson's work is to provide a (representational) theory of understanding stories about human activity. It is argued that the understanding of stories is achieved by assimilating them to past ones in which the details are known. The stored stories are, for the most part, made up of routinized sequences, called "scripts", and nonroutinized sequences of limited extent, called "plans". Scripts are structures which describe a sequence of events in a particular context, and are made up of slots and requirements about what can fill those slots. They handle stylized everyday situations:

> For our purposes, a script is a predetermined, stereotyped sequence of actions that define a well-known situation. A script is, in effect, a very boring little story. (Schank and Abelson 1977a:422)

In contrast to scripts, plans provide apparatus for handling novel situations:

> By finding a plan, an understander can make guesses about the intentions of an action in an unfolding story and use these guesses to make sense of the story. (Schank and Abelson 1977a:428)

This notion is important to Schank and Abelson because they think that any computer understanding system must be able to understand stories which are about new or unexpected situations.

It has been suggested, by Brand and others, that although Schank and Abelson concentrate on narratives, their theory and its objectives can be thought of in a broader sense as dealing with observed action and with the representation of intention in a theory of "intentional action". Brand uses their notions of scripts and plans — especially the latter — to capture what he regards as the distinctive cognitive feature of action which is intentional (i.e. the "planning" which we suggested in Chapter Five was similar to "prior intention").

In articulating the above account of comprehension, an underlying theory, called Conceptual Dependency Theory (CD), is developed by Schank and Abelson. This is supposed to be a theory of the representation of the meanings of sentences. The meaning propositions underlying language are called "conceptualisations", and the form that is postulated for them leads to a "principle of primitive actions". Since it is hoped to determine what is similar or different about an agent's actions (or the verbs which express them), it is thought essential to postulate a number of primitive acts:

> The best representation for our purposes for a given verb, then, will be the primitive element it shares with other verbs, plus the explicitly stated concepts that make it unique. (Schank and Abelson 1977b: 12)

Here are some examples of the primitive acts of CD:

ATRANS The transfer of an abstract relationship such as possession, ownership or control. One sense of "give" is ATRANS something to someone else.

PTRANS The transfer of the physical location of an object. Thus, "go" is PTRANS oneself to a place; "put" is PTRANS of an object to a place.

INGEST The taking in of an object by an animal to the inside of that animal. "Eat", "drink" and "smoke" are common examples of INGEST.

It is unclear just how these putative primitive acts are arrived at — there is a certain sense of arbitrariness about them (this is a criticism which we will return to when looking at the motivation for other theories of action representation). Presumably, they are thought of as intuitively obvious, or obvious for the needs of the theory. We should notice that the primitive or basic acts stipulated in Schank and Abelson's theory are quite different from the basic actions licensed by certain philosophical theories of action and action reports (Davidson 1980). In the philosophy of action, basic actions are said to be those actions which are not performed by doing anything else — the Davidsonian view is that bodily movements are in this category.

In contrast to this conception, Schank and Abelson seem to identify basic actions

with something like the decompositional primitives to which we alluded in the previous section. These primitives were thought to be the elements corresponding to a level of analysis "below" that of logical form. Our own view has been to approach semantics by characterising the activity of expressions (i.e. "syntactic simples") at the level of logical form. It should be said, however, that Schank and Abelson also provide a level of representation, "Knowledge Structure" (KS), as well as CD. This is supposed to answer the complaint that at the highest memory levels it will be necessary to organise information at places other than the primitive actions "and thus we will have to "unbreak down" again" (Schank and Abelson 1977b:17); i.e. a representation involving only CD would have the psychological implication that people always actually think of all the detail of the particular script they are using. In addition, KS has been construed as indicating the agent's goals, whereas CD is concerned with event sequences "in the world". The two forms of representation interact with one another. KS does not exactly correspond to our level of description, but there does seem to be some similarity: whereas in CD predicates are broken down in to primitives, KS deals with unanalysed expressions.

It was remarked in the preceding section that, in characterising the logic and semantics of expressions of purpose, intention or complex action, we eschewed the use of a causal primitive, or of a causal analysis, in such an enterprise. Not only did this sort of manoeuvre reflect a resort to a decompositional analysis, but it was not at all clear that the causal relation could bear the burden of explanation put upon it by such a theory. In other words, the causal relation is not the magic ingredient which allows us to represent the class of expressions we are interested in. In contrast to this, Schank and Abelson discuss a causal syntax that underlies natural language, and make the following (somewhat contentious) claim:

> A very simple causal syntax exists in natural thought, a syntax that can be violated in natural language expression. (Schank and Abelson 1977b: 24)

In connection with this, they include representations of certain causal links in CD. For example:


means an ACT results in a STATE.


means a STATE enables an ACT.

means an ACT results in a STATE which enables an ACT.

Relations like this enable a "hierarchical" representation of actions to be constructed — broadly speaking, "action plans" can be organised hierarchically (in KS) into goal-subgoal relationships. A representation of John opened a can of beer in CD is now something like

this:

John DO
⇑r
Beer OPEN

This is thought to convey the idea that John did something which resulted in the beer can being open. "John ate lobster at Lundy's" would be represented in CD as:

John PTRANS John to Lundy's
⇑rE
John INGEST lobster to INSIDE(John)
⇑rE
John PTRANS John from Lundy's

This illustration has been taken from a well-known example of Schank and Abelson's, "restaurant script", in which the agent is taken to have one overall goal. Schank and Abelson's account of action focusses on sequences of actions which take place one after another. As we shall see, this path has been taken by most other accounts of action representation.

Another theory, influential in A.I. and psychology literature, has been developed by Schmidt, Sridharan, and Goodson (Schmidt, Sridharan and Goodson 1976). It is concerned with what is sometimes called "plan recognition", and its advocates claim that it "presents the major structural components that are used to understand observed actions". It is also shown how theoretical assumptions lead to testable predictions about the form of people's summaries of their observations of an *action sequence*. An action sequence can be illustrated by the following:

1. Tom walked to the cabinet.
2. Next, Tom opened the cabinet door.
3. Next, Tom opened a box of cones.
4. Next, Tom took a cone out of the box.
5. Next, Tom closed the box.
6. Next, Tom put a cone on the cabinet.
7. Next, Tom closed the cabinet door.
8. Next, Tom walked to the refrigerator.
9. Next, Tom opened the freezer door.
10. Next, Tom closed the freezer door.
11. Next, Tom walked to the cabinet.
12. Next, Tom opened the cabinet door.

13. Next, Tom put the cone in the box.
14. Next, Tom closed the cabinet door.

It is observed that we are able to summarise such observations to produce a "coherent summary", e.g.

A. Tom got out a cone and went to the refrigerator to get some ice cream, but there wasn't any ice cream so he wasn't able to make an ice cream cone to eat.
B. Tom wanted to make an ice cream cone to eat, but there wasn't any ice cream.

as opposed to a "non-coherent" summary, e.g.

C. Tom walked to the cabinet, opened it, and put the cone away.

Schmidt et al claim that one measure of the understanding of observed actions is the ability to summarise the observations: the properties of a summary of intentional action are an inherent property of the understanding process. Furthermore, it is assumed that the understanding process is essentially a process of recognising the "plans" that generated the observed actions. Actions are linearly ordered in time (note the constant use of "next" in the example) whereas plans are "logically ordered", i.e. they have a "hierarchical structure". Schmidt et al stress the temporal, real world nature of actions as opposed to the abstract, logical structure of plans. A plan is a *hierarchical* structure of units each of which is also a plan. The temporal-logical contrast is played up in the literature, and it is partly because of it that the theory of logical forms, which was advocated in earlier chapters, seems to be germane [1]. The representational shift (plan recognition) from observations to plans is guided through the use of a structural representation of plan units which compose a plan and a logical representation of relations a plan enters into (a plan schema).

Regarding the composition of plan units, a number of relations are invoked. Perhaps of most interest to us are two labelled "In-Order-To" and "Means Of". The former constitutes a way of composing a particular plan out of a number of plan units. To say that one plan was done in order to do another constitutes a claim that the two plan units are really part of the same plan structure. The "Means Of" relation holds between a plan and plan structure (an In-Order-To connected sequence of plan units). It holds if the final goal

[1] Note that Schmidt et al do not make the mistake of saying that events *themselves* have logical properties. An event no more has logical properties than the table at which I am writing. What have logical properties are the underlying representations of event or action sentences.

of the plan structure can be viewed as the goal of the higher level plan unit. Figure 1 shows a diagrammatic example (which might be involved in the generation of a summary), derived from the earlier example of an action sequence.

It would be interesting to see whether any useful comparison can be made between the ideas implemented in representations advocated by Schmidt et al and those implicit in the perspective which we have adopted. The In-Order-To relation does not correspond to the IOT relation described in the previous section. The former is more like the FPO relation discussed earlier, since it expresses a relationship between two distinct actions. The Means Of relation seems, if anything, to be something like the "by" relation. They are probably not exactly the same because the Means Of relation involves what appear to be separate actions, and the action it summarises is really a number of connected but distinct actions. However, since no precise definition is forthcoming for any of the relations postulated by Schmidt et al, and since no mention is made of an underlying philosophical action theory, a detailed comparison may not be appropriate. In fact, in the theories that are influential in the A.I. literature, the hierarchical nature of the representation of actions (and "goals") and the relations thought to obtain, are the results of hypotheses which are not explicitly supported by formal or philosophical considerations. I turn now to more explicitly psychological theories about the nature of cognitive representations of human action. In order to make the transition, some general suggestions made by Rumelhart will be considered.

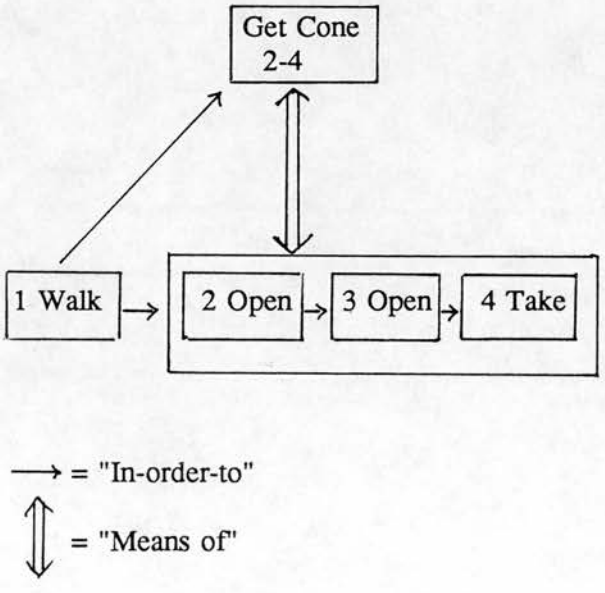


Figure 1.

A contribution to this area is made by Rumelhart who labels plans, scripts, frames, etc as "schemata" (Rumelhart 1980). In this sense a schema is something like a data structure representing generic concepts stored in memory, and is supposed to have a number of features. Schemata contain variables, can embed one within another, represent knowledge at all levels of abstraction, and are recognition devices whose processing is aimed at the evaluation of their goodness of fit to the data being processed.

Rumelhart presents his own "schema for stories" (Rumelhart 1975). Once again, a number of relations are described. Such semantic relationships (between events) carry labels such as CAUSE, ALLOW (like Schank and Abelson's "Result" and "Enable") and MOTIVATE. A set of rules is developed which maps semantic structures onto *summaries* of these structures: a summarisation rule is defined for each of CAUSE, ALLOW, etc. For example, ALLOW is summarised by using an action verb, and event causation is summarised by invoking notions of agent causation and temporal order.

The idea of "summarisation", in this case as in the earlier one, seems familiar from our discussion of the role of a theory of logical form in Chapter One. It was suggested there that characterising the behaviour of expressions at this level is a different enterprise from analysing or decomposing predicates into (semantic) primitives. It looks as if the level of logical form — characterising the "logical" behaviour of action-invoking predicates without further analysis — may be something like a level of summarisation. Although there is a resemblance, there is not enough evidence to permit any strict identification of these two levels.

What prevents us from making exact comparisons between the theories discussed so far and our own proposals adumbrated in the first section could be put down to the difference in conceptions of action adopted. The theories covered so far in this section make no allowance for the idea that an action is capable of falling under a number of different descriptions — the powerful concept which we have argued for and subsequently employed. In other words, we might say that, in contrast to reductive unifier theory of the previous section, the theories that we have looked at embody an event multiplier theory of action (if a theory of action can be pinned on them at all). One reason for thinking this is the preoccupation with temporal relations between actions, i.e. one action coming after another. This would explain why, whenever an attempt has been made to compare the action relationships proposed (e.g. ALLOW from Rumelhart, In-Order-To from Schmidt et al), the most attractive candidates from our own proposals are those which involve predication on more than one action (albeit under certain descriptions). Even then, due to the difference in underlying action theories, there is only a certain amount of similarity.

A more recent and influential set of experiments and proposals have been recorded by Lichtenstein and Brewer (Lichtenstein and Brewer 1980). In much the same vein as the

others, they say that

> In order to have a constructive theory of memory for behavioural events we need a theory of the structure of such events, which will describe how actions are related to one another to organize behaviour. (p.413)

They also inherit from the other theorists the assumption that behaviour is hierarchically organised into structures, often called "plans". In addition, the underlying relation of such hierarchies, the "goal-subgoal" relation, is retained. Once again, the In-order-to relation that is defined approximates to our FPO relation, e.g.

Open door In-order-to remove milk.

The In-order-to relationship *implies* a temporal relationship in that subordinate acts are supposed to be performed before their superordinates (in the above example we open the door before taking the milk). However, the temporal relationship between acts does not imply the In-order-to relationship [2]. As well as the latter, there are two other relations pertaining to plan schemata. The familiar "Enable" and "Cause" relationships provide interhierarchy ("between hierarchy") structure, while the In-order-to relation provides intrahierarchy ("within hierarchy") structure. The hierarchical structures that Lichtenstein and Brewer posit have been adopted by subsequent writers, such as Brewer and Dupree, who provide evidence to show that, over time, information about actions is lost from hierarchical plan structure from the bottom up (Brewer and Dupree 1983).

Experiments were performed by Lichtenstein and Brewer firstly to show that observers of an event can agree on the inferred goal structure and the intentional relationships between actions which compose a plan schema. In the second place they were to show that observers use a plan schema for encoding actions, for retrieving information about actions at recall, and for reconstructing the temporal order of these actions. In view of the last point we would expect that the action theory underlying Lichtenstein and Brewer's view would emphasise "logical" characteristics of action descriptions rather than temporal ones. However, this is not the case.

The actions that Lichtenstein and Brewer seek to explain are actually sequences of actions (c.f. earlier discussion of Schmidt et al). For example:

1) Smith places the letter on the desk.

---

[2] In other words, you can do something before doing something else, but not in order to do it. I think that something like this confusion arose in the course of the Bennett-Lemmon proposal discussed in an earlier chapter, which led to the possibility of a spatio-temporal relationship between actions obscuring an intentional relationship.

2) He opens the front drawer of the desk.
3) He removes a pen from the drawer.
4) He takes the cap off the pen.
5) He signs the letter.
6) He puts the cap back on the pen.
7) He places the pen in the drawer.
8) He closes the drawer.

The sort of hierarchy which is thought to underlie such an observed (or understood) sequence of actions, which involves an In-order-to relation defined over a goal-subgoal relation, cannot account for situations in which an agent does one thing by doing another, i.e. those situations which are captured by the "by" adverb in the first section, and which are the natural targets of the theory of action which we support. Sequences of actions are all that concern Lichtenstein and Brewer, and their theory is built up around them. This results in a hierarchical structure which is only appropriate for actions performed one after another, and will not fully account for descriptions of action(s) like the following, which are common enough:

> "While walking down Princes Street, Smith saw an old friend, and waved to him. His gesture was seen by motorists as a signal to stop. In stopping the traffic, Smith averted an accident."

Among other things, we would like to say:

Smith prevented an accident by signalling.
Smith signalled by waving.
Smith waved in order to greet a friend.
Smith unintentionally prevented an accident.

This is not (wholly) a sequence, nor does a hierarchical relation determine a temporal one (in fact, it is difficult to isolate the temporal relationships in examples like this). What seems to be required is that the underlying structures posited by Lichtenstein and Brewer allow for more complex relationships between actions than those suggested by their "In-order-to". The hierarchies could be given additional structure, or a new representation could be proposed to replace them.

In fact, Lichtenstein and Brewer do mention ideas familiar to the reductive unifier theory of events. During the "norming study"

> Decisions that descriptions by two subjects referred to the same action were made using a loose gist criterion. Thus, "flicking the switch" and "turning on the lights" would, in the same context, be counted as occurrences of the same action. (p.412)

In other words, the relationship between reports of "flicking the switch" and "turning on the lights" was simply built into the assumptions of the construction of the hierarchy and not into the hierarchy itself. This has the effect of obscuring such relations, and reducing the amount of structure in the resulting representation. In making such relationships part of the motivation of our action theory, we will be able to make proposals which will result in a different view of action and which will lead to richer and better defined structures.

The final proposal to be considered in this section is due to Foss and Bower (Foss and Bower 1987). Once again it is assumed that actions are represented in terms of goal relationships and that goals are typically arranged in a hierarchy of subgoals. The idea is embodied in a "goal-reduction tree"; any node in the tree except the top node and the terminal nodes can be a "goal" or an "action" depending upon whether it is viewed from "below" or "above" (see Figure 2).

Figure 2: example of goal hierarchy/reduction tree

In the experiments, the hypothesis that is tested is that "distance effects" are present in people's comprehension of actions in the light of the actor's goals. What is important, from our point of view, is that a somewhat imprecise goal-subgoal relation is adopted which once again makes no allowance for those examples in which we would not be inclined to say that a sequence of events had occurred. Like the other theories, the importance of the "logical organisation" of plans and the "logical ordering" of actions is stressed, but no theory supporting such logical properties is offered. Another feature, common in theories of this sort, is that the representation has a simple pyramid-like structure — one main goal spawns a number of subgoals. In the next section an attempt is made to use the theory of action and the logico-semantic observations made in the first section to support proposals concerning a different sort of action structure.

3. A Different Approach

In this section a different approach to the construction of underlying "action hierarchies" will be proposed which is based on the action theory and insights from the logical form proposals alluded to earlier. To begin with, however, an attempt will also be made to show how this sort of approach can be integrated with a recent set of proposals and hypotheses which appear in the psychological literature. Not all psychological theories contain assumptions which run counter to our own.

A psychological theory, which seems to be in accord with our earlier semantical considerations, has been put forward by Vallacher and Wegner (Vallacher and Wegner 1985, Vallacher and Wegner 1987, Wegner and Vallacher 1986). Issues in the cognitive representation and control of action are broached from the perspective of "*action identification theory*", which holds that any action can be identified in many ways. In other words, unlike theories derived from work by Schank and Abelson, Vallacher and Wegner do not attempt to break actions down into more primitive subactions (or parts of actions), but instead allow that actions may be redescribed in certain informative ways. Naturally, this perspective is close to the one which has been advocated in earlier chapters. The level of identification most likely to be adopted by an actor is supposed to be dictated by processes reflecting a trade-off between concerns for comprehensive action understanding and effective action maintenance. This identification of an action, which is the most accessible to the person at the time, is termed the person's "prepotent identity". So, the identification of one's action, though highly variable in principle, is ultimately constrained by reality. Act identities are thought to bear systematic relations to one another in an organised cognitive representation of the action — the action's "identity structure", which is a complex hierarchical arrangement of an action's various identities.

Some examples of identity structures for certain actions are put forward (Vallacher and Wegner 1985, Wegner and Vallacher 1986). Having recognised the importance of the "by"-relation in action description, Vallacher and Wegner use the relation to motivate an identity structure for "robbing a store" (Figure 3). The "by"-relationship is used as the tool for uncovering the organisation of a set of action identities, relations between levels being "by"-relations. In linguistic terms the "by"-relation is less vague than the subgoal relation employed by theories discussed earlier.

Identity structures help to illustrate the fact that, in searching for the "meaning" of an action, people move towards (and settle upon) higher and higher identities. It is also remarked that, given one identity of an action, a lower level identity suggests how the first identity was brought about; a higher identity specifies why the first identity was undertaken. In contrast to our own perspective on action, in Figure 3 it is not clear whether we are talking about a generic act of robbing a store — showing all the ways in

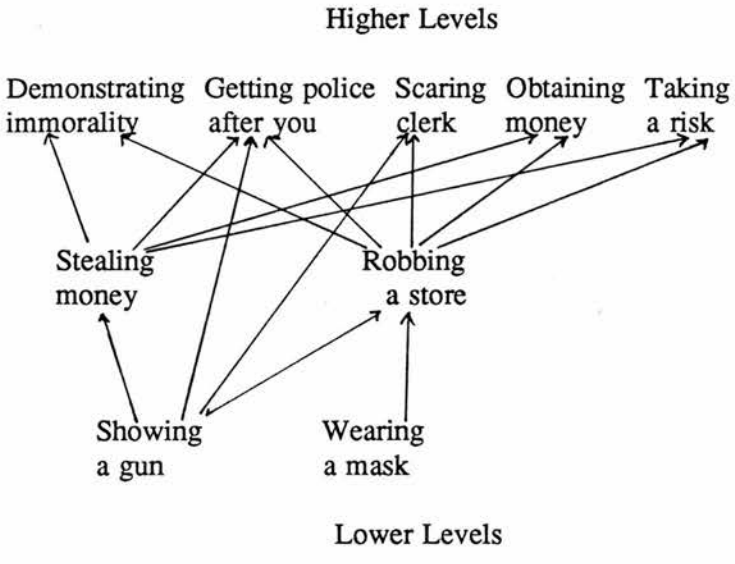


Figure 3: "Robbing a store" identity structure.

which it could be described in any circumstances — or the particular act of robbing a store. Taking a Davidsonian approach, we are interested in the information pertaining to a particular action, rather than a general action type or "universal".

The theory is slightly different from others discussed since the perspective which seems to be taken involves consideration of the way in which an actor identifies his *own* action. The "script theorists" that we have looked at have suggested that a hierarchy or script is relevant to the representation of an action that is oriented toward a goal (Schank and Abelson 1977b), and is used to reconstruct the order of observed actions for recall. The proposals made by Vallacher and Wegner could be generalised to cover an agent's interpretation and understanding of observed action or action acknowledged in stories. The same sort of generalisation is made when, for example, Brand uses ideas due to Schank and Abelson to give an account of the proximate cognitive cause of intentional action (Brand 1984). What we are interested in is such a "generalised" account of cognitive representations. A major difference between action identification theory and earlier theories is that the former abandons the idea that a representation is to be pyramid-like structure. Since identity structures can have a number of identities at any level, the resulting representation exhibit more complexity than a simple pyramid structure. Our own proposals will similarly reject the idea of a pyramid-like hierarchy.

The main difference between this and other theories, however, is that in the present case the proposals made seem to be in accord with a reductive unifier theory of human action. The idea of an action's "identity structure" is a way of expressing the notion that an agent's behaviour is capable of being described in more than one way. Furthermore,

extending Vallacher and Wegner's proposals slightly, we could think of an identity structure as a dynamic sort of representation which permits further information about an action to be added in the form of additional descriptions which the action satisfies. In view of this, it is surprising that, although Vallacher and Wegner acknowledge the work of some philosophers of action (e.g. Goldman, Danto, and Anscombe) they do not dwell upon Davidson's theory, which seems to fit in nicely with their proposals — the Davidsonian notion of recharacterising an action by (adverbial) redescription would usefully supplement their theory.

The idea of redescription is embodied in the logical form proposals given earlier. The characterisation of the logical behaviour of predicates associated with purposeful action provides relations which may be of use in the theory put forward by Vallacher and Wegner. In the conclusion of a recent paper (Vallacher and Wegner 1987), they allude to the "complexity of identity structures", bringing with it "flexibility and individuality to the mental control of action" (p13). Presumably, this characteristic of action structures is the same sort of characteristic which would be responsible for allowing further information to be added about an action, such as its consequences and the agent's intentions. Although the role of an action structure is explained, little attempt is made to describe or develop such a structure, or illustrate the relations involved by means of an example. In what follows an attempt will be made to do this. Our proposal will employ the Davidsonian action theory supported earlier, which was manifested in the logical form proposals put forward in the preceding chapter.

As has been discussed in the previous section, the sorts of relations which will be necessary in order to get our account of representations going divide into intrastructure and interstructure relations. The structures that I have in mind can be shown diagrammatically. In Figure 4, and in subsequent digrams, the letters "a", "b", "c", etc stand for descriptions, while the boxes enclosing them are the identity structures for actions, i.e. each action is represented as such a structure.

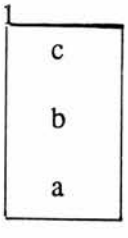


Figure 4.

Furthermore, each structure is numbered, since more than one will be needed in each description of an "act sequence". As will become clear, the structures are similar to Goldman's act trees, except that they have a reductive unifier interpretation (Goldman

1970). Much the same idea is employed by Vallacher and Wegner, but to different overall effect.

The role of identity structures and relations may be illustrated with examples. Consider, first, the following scenario:

> A. "I take my hand out of my pocket so that I can raise my arm to greet a friend. However, this is seen as a signal by oncoming traffic. The signal stops the traffic and prevents an accident."

Given this, and using our theory of action, we can enumerate the actions which occurred as follows (using a Davidsonian idea of actions as bodily movements) with an example of one of the descriptions that each of them falls under:

1. e.g. taking hand out of pocket
2. e.g. signalling.

We can also label the descriptions under which actions fall using letters, thus:

a. take hand out of pocket
b. raise arm
c. greet friend
d. signal
e. stop traffic
f. prevent accident

Our relations, which derive from the earlier logico-semantic project to reveal the conceptual resources of reports of purposeful behaviour, and which were summarised in the first section, are signified as follows:

"BY": <== (cf. "ENABLE" earlier)

"FPO": ==>

"by": ↓

"IOT": ↑

For the nonce, these are the only relations which will be invoked, although it is possible that the account could be extended to accommodate other expressions of intention and

action which have been discussed. From our earlier observations, we can say that "==>" (FPO), for example, signifies a relationship between a description of one action and a description of a distinct action. Using these, a representation ("plan schema") for A can be constructed (Figure 5).

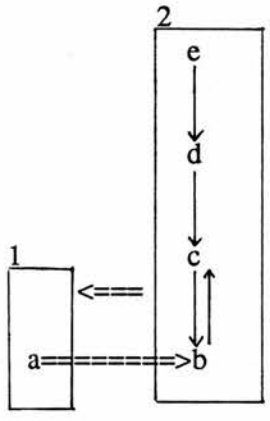


Figure 5

The arrow, "<==", in representing the extensional "BY" remains outside the boxes, whereas "==>", representing the intensional "FPO", is associated with descriptions inside the boxes. So, "==>" relates description "a" of action 1 and description "b" of action 2 ("take hand out of pocket "for the purpose of" raising arm"), "↑" relates descriptions "b" and "c" of action 2, etc. A slightly more complicated example of a scenario involving a chess-game follows.

> B. "First of all I moved my pawn, which surprised my opponent. This move was made so that I could move my queen out. By so doing, I checkmated my opponent and won the national contest. This allowed me to enter the international tournament."

Once again, we can enumerate the actions, giving an example of a description under which each falls.

1. e.g. move pawn
2. e.g. move queen
3. e.g. enter tournament

The descriptions under which actions fall can be listed:

a. move pawn

b. surprise opponent

c. move queen

d. checkmate opponent

e. win contest

f. enter tournament

We can summarise actions and descriptions thus:

```
1 {a   2{c   3{f
  {b    {d
        {e
```

Using the same relations as before, an underlying representation can be constructed (Figure 6).

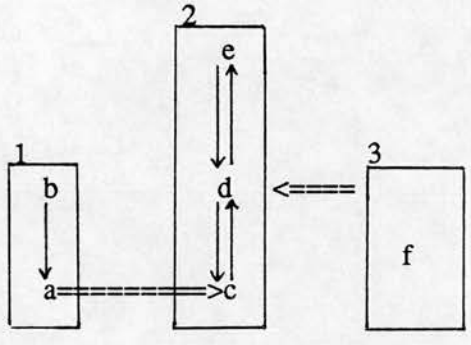


Figure 6

In effect, what we have done by constructing the above "underlying representations" for the actions described is to implement theoretical considerations presented in the first section. Adherence to the reductive unifier theory of action enables us to build up "identity structures" in a more principled way than Vallacher and Wegner. In addition, the considerations which led to logical form proposals for adverbs of action help to supply the relations required for inter- and intrahierarchical structure. These structures could be regarded as being "dynamic", i.e. they could be thought of as allowing further information, in the form of more descriptions which the action fits, to be added. The examples which I picked to illustrate the form of representation advocated have been simple, but more complicated scenarios, expressed using constructions covered in Chapter Six, could be accommodated by extending the basic framework. In this way, conjectures made by Vallacher and Wegner, regarding the complexity of identity structures and the fact that they are likely to have different characteristics from the more usual action hierarchies, have been articulated in more detail.

What has been presented in this section should be regarded as initial, introductory remarks for an account which is in accord which the theoretical perspective described in the first section. It may be possible to develop a more detailed account of representations and relations, and to modify the suggestions made above in order to accommodate further principles which arise from of Vallacher and Wegner's action identification theory.

4. Discussion

The preceding section showed how we could make a contribution to theories concerned with the cognitive representation of action. It can be claimed that, as a result of the considerations of earlier chapters, the suggestions which were made were based on a particular theoretical position. In this sense, the proposals were on a firmer footing than those of Vallacher and Wegner. This point can be illustrated. In their investigation of how "knowing what one is doing" can shape and be shaped by action, Vallacher and Wegner cannot make any specific commitment to a theory of action (Vallacher and Wegner 1985: 8). However, as Searle remarks (Searle 1980):

> Cognitive Science is likely to make little progress in the study of human behaviour until we have a clear account of what human action is. (p.47)

It is not simply that it sounds nicer if we can actually say what we think action is: there are likely to be inconsistencies within the theory which is being presented if no particular characterisation of action is settled upon.

Vallacher and Wegner seem to allow "by" to account for a general relationship between action identities. For example, they assume that the following examples are covered by "by" (Vallacher and Wegner 1985):

"driving home"
"going to the car park"

On our account, these would not be two descriptions of the same action. A Davidsonian theory of action, requiring that actions be bodily movements (broadly construed) which are intentional under at least one description, judges the above to be distinct actions. We might say that Smith drove home "by" going to the car park, but we would be using "by" in the sense of "enable", i.e. our relation "BY" would be the appropriate one.

Another feature of our account which does not appear in Vallacher and Wegner's is the importance of intention in describing action. The distinction between what is intentional and what is merely a "side-effect" of action is not accommodated. The fact that our own scheme for representation contains relationships between actions and descriptions other

than "by" makes it a potentially richer and more expressive format which could help to motivate further investigation of the structure of cognitive representations. Vallacher and Wegner recognise that the unique way in which humans are conscious of their actions is a result of a capacity for abstract representation which is reflected in natural language (Vallacher and Wegner 1985: 38-39). In view of this, the previous study of the conceptual resources of sentences of natural language was an appropriate way of approaching the study of the way in which we represent human action.

All along, we have tried to get along without devising a specific treatment of temporal phenomena associated with actions and events. This is not because the interactions between human action and time are too trivial to mention. In part, our disregarding the temporal properties of actions has resulted from a dissatisfaction with the usual way of approaching event and action theory, which proceeds from the study of the way in which action and time are related.

The shift to studying the interactions between actions themselves (and their descriptions) has been mirrored to some extent in parts of the Artificial Intelligence literature that have not yet been discussed. Moens has recently remarked that, in reaction to the shortcomings of formalisms which only take account of the temporal relationships between events, recent work in Artificial Intelligence has been concerned to portray events as entering into more complex (non-temporal) relationships (Moens 1987). The systems that he focusses on are those which were developed with natural language applications in mind.

It is interesting to note that the systems which are thought to be more sophisticated do not embody the idea of action redescription. It is thought that a better understanding of "cause and effect" would make better planning systems (Drummond 1984). Our approach does not eschew the causal relation as one which helps to depict the interactions of actions and events. However, it is not the only relation, and it does not solve all problems. Events may be individuated in causal terms, but, as we suggested earlier, what is special about actions is that they participate in the "by" relation.

One theory of activity representation which Moens draws upon is due to Lansky (Lansky 1986). A feature of this account is of interest to us. Lansky proposes to "reify" events a la Davidson and to focus on their causal and temporal interrelationships. Activity is "located" with respect to temporal and causal frameworks. Instead of concerning herself simply with actions performed by a sole agent, Lansky attempts to represent multi-agent domains. I shall not present an account of this sort of representation. Instead I suggest that this is a direction which further research could take.

Recent developments in other areas, such as grammar formalisms and parsing, indicate that our earlier proposals could have further application. I am referring to work in

Unification Categorial Grammar (UCG) (Zeevat, Klein and Calder 1987), which attempts, among other things, to integrate syntax and semantics. The semantic representation language is derived in part from Kamp's Discourse Representation Theory (Kamp 1981). However, rather than use a "box" representation, the formulae are linear, and therefore more familiar to us. In addition, the semantics adopts a Davidsonian (event) treatment of verbs and adverbs. The part of the theory which is of most immediate interest to us is the set of proposals concerning adverbial modification. Lexical entries, or "signs" of expressions carry phonological, syntactic and semantic representations. A glance at the sign for the adverb "quickly" will indicate that the UCG formalism bears a certain resemblance to proposals for adverbs made in earlier chapters:

quickly
C(sent/np)/C(sent/np):[a]S:post
[event(a)][QUICK(a,S), S]

The third line is concerned with the semantics of the expression, and shows that the "index" of the formula (the entity which the formula as a whole determines) is an event. The position of "S", which characterises the action, indicates a similarity between this and our own representation of attributive adverbs: the "S", in doing double duty in the semantic representation, is catering for the attributivity of the adverb. In an earlier chapter we adopted the same sort of manoeuvre in different circumstances. In view of this similarity, and the endorsement of a Davidson-like perspective on verb semantics, it may be possible to tailor the suggestions made earlier about the treatment of reports of complex and purposeful action to the needs of the UCG framework proposed by Zeevat et al. Since these sorts of expressions do not seem to have been explicitly addressed in that formalism, I suggest that this constitutes another direction for further research.

In discussing the implications of proposals made in earlier chapters for related work in different disciplines, we have seen how a well-articulated theory or set of ideas can usefully inform an examination of such work. I believe that what has been presented here and in preceding chapters represents a more illuminating liason than the one alluded to in the first chapter between the Putnam/Kripke causal theory of reference and work by Carey and Keil in cognitive psychology. In that case, it looked as if philosophical "results" were tacked onto a psychological theory, whereas the present study acknowledges the possibility of interaction between allied disciplines resulting in a shift in perspective. It is hoped that a study like ours will help to promote the idea of beneficial cooperation and coevolution of theories in different related areas.

Conclusion

It has been possible to make an interdisciplinary study of action in this chapter because of the theoretical considerations which resulted from preceding chapters. Most of the theories which were examined in the chapter made no explicit commitment to a theory of action. In contrast, we have developed a perspective on human action via the study of the semantics of reports which attribute intentional and complex activity to agents. The resulting set of ideas allowed us to augment suggestions regarding the representation of action within the psychology literature with our own proposals. It is now possible to take a broader view and state the line of enquiry presented in the thesis, and summarise the ground covered.

At the outset, in Chapter One, an analysis of theories drawing on Davidson's philosophy enabled us to characterise our own interpretation of "Davidson's programme". This involved a recognition of the different but related aspects of his philosophy. More specifically, the collaborative relationship between semantics and metaphysics was introduced and explored.

While retaining important parts of Davidson's proposals for the treatment of action sentences containing adverbs, Chapter Two included a discussion of the problems which have been thought to confront such an account. In addition, having recognised the significance of event theory in a theory of adverbial modification, the second half of Chapter Two contained a taxonomy of event theories and went on to suggest reasons why we might incline towards a specific theory, viz. a Lombardian-unifier theory.

Since a number of problems surrounding a semantic theory for action reports arise when intensional contexts are considered, Chapter Three discussed and cast into doubt Davidson's paratactic manoeuvre for circumventing these difficulties. In doing so, the idea of utterances of open sentences was approved. The second part of the chapter went on to deal with the accommodation of demonstrative constructions within a Davidsonian framework. As a result, a (conditional assignment) proposal along lines suggested by Burge was endorsed.

Chapter Four presented a theoretical perspective on human action and put forward the idea that redescription was an important element in action theory. The "by"-locution was isolated as important in the ascription of complex activity involving apparent multiplicity of action. A number of suggestions were put forward, and subsequently rejected, as ways of representing this sort of attribution. In the light of these considerations, a Davidsonian proposal was then considered as an initial form of representation. The endorsement of this contributed towards the treatment of attributions of complex activity in later chapters.

Chapter Five provided an account of intending to act, acting intentionally, and

refraining from action. In so doing, a distinction was drawn between intending to do something and doing it intentionally. This distinction was reflected in the account of refraining, which made explicit the intentional elements involved in forbearance. These theoretical considerations made way for representational issues in the next chapter.

Implementing ideas and proposals put forward in earlier chapters, Chapter Six provided a guide to the treatment of reports of action which involved intention and complexity. The conceptual and representational apparatus was employed to accommodate representatives of a family of expressions. In carrying this out, Davidson's original proposals for the treatment of adverbs were modified and extended. Examples which received attention included the following forms:

A x-ed by y-ing. (two senses)

A x-ed in order to y. (two senses)

A x-ed intentionally. (representative of intentional adverbs)

A intended to x.

A refrained from x-ing.

It was adverb of A to x. (subject-oriented adverbs)

The resulting view of action and attribution allowed an informed examination of theories of the cognitive representation of action in Chapter Seven. Most of these accounts embodied a distinctive view of the structure of action "hierarchies" which contrasted with the view developed in earlier chapters. Such a comparison thus resulted in a shift in perspective, which embodied a move from multiplicity to redescription. This sort of approach was found to be in accord with a recent "theory of action identification", and suggestions were made concerning the augmentation of that theory. Additionally, other topics were identified as suitable for further research.

Bibliography

Adams, F. (1986) Intention and Intentional Action: The Simple View. *Mind and Language*, **1**, 281-301.

Anscombe, G. E. M. (1957) *Intention.* Oxford: Blackwell.

Antony, L. M. (1987) Attributions of intentional action. *Philosophical Studies*, **51**, 311-323.

Austin, J. L. (1970) A Plea for Excuses. In *Philosophical Papers*, Second Edition, pp175-204. Oxford: Oxford University Press.

Bach, E. (1981) On time, tense, and aspect: an essay in English metaphysics. In Cole, P. (ed.) *Radical Pragmatics*, pp63-81. New York: Academic Press.

Bach, E. (1986) Natural Language Metaphysics. In Marcus, R. B., Dorn, G. J. W. and Weingartner, P. (eds.) *Seventh International Congress of Logic, Methodology, and Philosophy of Science*, 1986, pp573-595.

Bach, E. (1986) The algebra of events. *Linguistics and Philosophy*, **9**, 5-16.

Baker, L. R. and Wald, J. D. (1979) Indexical Reference and De Re Belief. *Philosophical Studies*, **36**, 317-327.

Barwise, J. and Perry, J. (1983) *Situations and Attitudes.* Cambridge, Mass.: MIT Press.

Bennett, J. (1985) Adverb-dropping inferences and the Lemmon criterion. Chapter 14 in LePore, E. and McLaughlin, B. (eds.) *Actions and Events*, pp177-206.

Boer, S. and Lycan, W. (1986) *Knowing Who.* MIT Press.

Brand, M. (1971) The Language of Not Doing. *American Philosophical Quarterly*, **8**, 45-53.

Brand, M. (1976) Particulars, events and actions. In Brand, M. and Walton, D. (eds.) *Action Theory*, pp133-157. Dordrecht: D. Reidel.

Brand, M. and Walton, D. (eds.) (1976) *Action Theory*. Dordrecht.

Brand, M. (1977) Identity conditions for events. *American Philosophical Quarterly*, **14**, 329-337.

Brand, M. (1979) On Tye's "Brand on event identity". *Philosophical Studies*, **36**, 61-68.

Brand, M. (1984) *Intending and Acting: Toward a naturalized theory of action.* Cambridge, Mass.: MIT Press.

Brewer, W. F. and Dupree, D. A. (1983) Use of plan schemata in the recall and recognition of goal-directed actions. *Journal of Experimental Psychology*, **9**, 117-129.

Burge, T. (1974) Demonstrative Constructions, Reference, and Truth. *Journal of Philosophy*, **71**, 205-223.

Burge, T. (1977) Belief De Re. *Journal of Philosophy*, **74**, 338-362.

Burge, T. (1986) On Davidson's "Saying that". Chapter 10 in LePore, E. (ed.) *Truth and Interpretation: Perspectives on the philosophy of Donald Davidson*, pp190-208. Basil Blackwell.

Carey, S. (1982) Semantic development: the state of the art. Chapter 12 in Wanner, E. and Gleitman, H. (eds.) *Language Acquisition: The State of the Art*, pp347-389. Cambridge: Cambridge University Press.

Carnap, R. (1947) *Meaning and Necessity*. Chicago, Illinois: The University of Chicago Press.

Castaneda, H. (1966) "He": A study in the logic of self-consciousness. *Ratio*, **8**, 130-157.

Castaneda, H. (1967) Indicators and Quasi-indicators. *American Philosophical Quarterly*, **4**, 85-100.

Castaneda, H. (1975) *Thinking and Doing*: *The philosophical foundations of institutions.* Dordrecht: D. Reidel.

Castaneda, H. (1979) Intensionality and Identity in Action and Philosophical Method. *Nous*, **13**, 235-260.

Chisholm, R. M. (1966) Freedom and action. In Lehrer, K. (ed.) *Freedom and Determinism.* New York: Random House.

Clark, R. (1970) Concerning the logic of predicate modifiers. *Nous*, **4**, 311-335.

Cresswell, M. J. (1973) *Logics and Languages.* London: Methuen.

Cresswell, M. (1974) Adverbs and events. *Synthese*, **28**, 455-481.

Cresswell, M. J. (1979) Interval semantics for some event expressions. In Baeuerle, R., Egli, U. and von Stechow, A. (eds.) *Semantics from Different Points of View.* Berlin: Springer-Verlag.

Cresswell, M. (1985) *Structured Meanings.* Cambridge, Mass.: MIT Press.

Cresswell, M. J. (1986) *Adverbial Modification.* Dordrecht: D. Reidel.

Dancy, J. (ed.) (1980) *Papers on Logic and Language.* Keele University Library.

Danto, A. (1966) Freedom and forbearance. In Lehrer, K. (ed.) *Freedom and Determinism*, pp45-63.

Danto, A. (1973) *Analytical Philosophy of Action.* Cambridge: Cambridge University Press.

Davidson, D. (1963) Actions, reasons, and causes. *Journal of Philosophy*, **60**. Reprinted in Davidson (1980) pp3-19.

Davidson, D. (1967) The logical form of action sentences. In Rescher, N. (ed.) *The Logic of Decision and Action.* Pittsburgh: University of Pittsburgh Press.

Davidson, D. (1967) Truth and meaning. *Synthese*, **17**, 304-323. Reprinted in Davidson (1984) pp17-36.

Davidson, D. (1967) Causal Relations. *Journal of Philosophy*, **64**. Reprinted in Davidson (1980) pp149-162.

Davidson, D. (1968) On Saying That. *Synthese*, **19**, 130-146. Reprinted in Davidson (1984) pp93-108.

Davidson, D. (1969) The Individuation of Events. In al, N. R. (ed.) *Essays in Honour of Carl G Hempel*, pp216-234. Reidel.

Davidson, D. (1969) True to the Facts. *Journal of Philosophy*, **66**, 748-764.

Davidson, D. (1971) Agency. In Binkley, R., Bronaugh, R. and Marras, A. (eds.) *Agent, Action and Reason.* Reprinted in Davidson (1980) pp43-62.

Davidson, D. (1974) On the very idea of a conceptual scheme. In *Proceedings and addresses of the American Philosophical Association*, Volume 47. Reprinted in Davidson (1984) pp183-198.

Davidson, D. (1977) Reality without reference. *Dialectica*, **31**, 247-253. Reprinted in Davidson (1984) pp215-225.

Davidson, D. (1977) The method of truth in metaphysics. In French, P. A., Uehling, T. E. and Wettstein, H. K. (eds.) *Midwest Studies in Philosophy*, Volume 2: *Studies in the philosophy of language.* Reprinted in Davidson (1984) pp199-214.

Davidson, D. (1979) Moods and Performances. In Margalit, A. (ed.) *Meaning and Use.* Dordrecht: D. Reidel. Reprinted in Davidson (1984) pp109-121.

Davidson, D. (1980) *Essays on Actions and Events.* Oxford: Clarendon Press.

Davidson, D. (1984) *Inquiries into Truth and Interpretation.* Oxford: Clarendon Press.

Davidson, D. (1985) Reply to Bruce Vermazen. In Vermazen, B. and Hintikka, M. B. (eds.) *Essays on Davidson: Actions and Events*, pp217-221. Oxford: Oxford University Press.

Davidson, D. (1985) Adverbs of Action. In Vermazen, B. and Hintikka, M. B. (eds.) *Essays on Davidson: Actions and Events*, pp230-241. Oxford: Clarendon Press.

Davies, M. (1982) Individuation and the semantics of demonstratives. *Journal of Philosophical Logic*, **11**, 287-310.

Davis, L. H. (1979) *Theory of Action.* Englewood Cliffs, New Jersey: Prentice-Hall.

Dowty, D. R., Wall, R. E. and Peters, S. (1981) *Introduction to Montague Semantics.* Dordrecht: D. Reidel.

Drummond, M. (1984) Non-linear planning in terms of cause and effect. Research Paper, Department of Artificial Intelligence, University of Edinburgh, Edinburgh, Scotland, July, 1984.

Fodor, J. A. (1978) Propositional Attitudes. *The Monist*, **61**, 501-523.

Foss, C. L. and Bower, G. H. (1987) Understanding actions in relation to goals. Chapter 4 in Sharkey, N. E. (ed.) *Advances in Cognitive Science*, Volume 1, pp94-124. Chichester: Ellis Horwood.

Goldman, A. (1970) *A Theory of Human Action.* Prentice-Hall.

Gustafson, D. F. (1986) *Intention and Agency.* Dordrecht: D. Reidel.

Hacker, P. M. S. (1982) Events, ontology and grammar. *Philosophy*, **57**, 477-486.

Hacker, P. M. S. (1982) Events and Objects in Space and Time. *Mind*, **XCI**, 1-19.

Harman, G. (1972) Logical Form. *Foundations of Language*, **9**.

Higginbotham, J. (1986) Linguistic theory and Davidson's program in semantics. Chapter 2 in LePore, E. (ed.) *Truth and Interpretation: Perspectives on the philosophy of Donald Davidson*, pp29-48. Basil Blackwell.

Hornsby, J. (1977) Saying Of. *Analysis*, **37**, 177-185.

Hornsby, J. (1980) *Actions*. London: Routledge and Kegan Paul.

Hornsby, J. (1980) Verbs and Events. In Dancy, J. (ed.) *Papers on Logic and Language*, pp88-111. Keele University Library.

Jackendoff, R. S. (1972) *Semantic Interpretation in Generative Grammar*. Cambridge, Mass.: MIT Press.

Kamp, H. (1981) A theory of truth and semantic representation. In Groenendijk, J. A. G., Janssen, T. M. V. and Stokhof, M. B. J. (eds.) *Formal Methods in the Study of Language*, Volume 136, pp277-322. Amsterdam: Mathematical Centre Tracts.

Kaplan, D. (1978) Dthat. In Cole, P. (ed.) *Syntax and Semantics*, Volume 2: *Pragmatics*, pp221-243. New York: Academic Press.

Katz, J. J., Leacock, C. and Ravin, Y. (1985) A Decompositional Approach to Modification. Chapter 15 in LePore, E. and McLaughlin, B. (eds.) *Actions and Events*, pp207-234. Oxford: Basil Blackwell.

Katz, J. J. (1987) Common sense in semantics. Chapter 6 in LePore, E. (ed.) *New Directions in Semantics*, pp157-233. Academic Press.

Keil, F. C. (1983) Inferences and the acquisition of word meaning. In Seiler, T. B. and Wannenmacher, W. (eds.) *Concept Development and the Development of Word Meaning*, pp103-125. Berlin: Springer-Verlag.

Kenny, A. (1963) *Action, Emotion and Will*. London: Routledge and Kegan Paul.

Kim, J. (1966) On the psycho-physical identity theory. *American Philosophical Quarterly*, **3**, 227-235.

Kim, J. (1969) Events and their descriptions: some considerations. In Rescher, N. (ed.) *Essays in Honor of Carl G. Hempel*, pp198-215. Dordrecht: D. Reidel.

Kim, J. (1976) Events as property exemplifications. In Brand, M. and Walton, D. (eds.) *Action Theory*, pp159-177. Dordrecht: D. Reidel.

Kripke, S. (1972) Naming and Necessity. In Davidson, D. and Harman, G. (eds.) *Semantics of Natural language*, pp253-355. Dordrecht: D. Reidel.

Lansky, A. L. (1986) A representation of parallel activity based on events, structure, and causality. In *Workshop on Planning and Reasoning about Action*, Timberline Lodge, Mount Hood, Oregon, 1986, pp50-86.

LePore, E. and McLaughlin, B. (eds.) (1985) *Actions and Events*: *Perspectives on the Philosophy of Donald Davidson.* Oxford: Basil Blackwell.

LePore, E. (ed.) (1986) *Truth and Interpretation*: *Perspectives on the Philosophy of Donald Davidson.* Oxford: Basil Blackwell.

LePore, E. (ed.) (1987) *New Directions in Semantics.* London: Academic Press.

Lemmon, E. J. (1967) Comments on Davidson's "The Logical Form of Action Sentences". In Rescher, N. (ed.) *The Logic of Decision and Action*, pp96-103. Pittsburgh: University of Pittsburgh Press.

Lichtenstein, E. H. and Brewer, W. F. (1980) Memory for goal-directed events. *Cognitive Psychology*, **12**, 412-425.

Lombard, L. B. (1985) How not to flip the prowler: Transitive verbs of action and the identity of actions. Chapter 17 in LePore, E. and McLaughlin, B. (eds.) *Actions and Events*: *Perspectives on the philosophy of Donald Davidson*, pp268-281. Oxford: Basil Blackwell.

Lombard, L. B. (1986) *Events*: *A metaphysical study*. London: Routledge and Kegan Paul.

Lycan, W. G. (1984) *Logical Form in Natural Language.* Cambridge, Massachusetts: MIT Press.

Martin, R. M. (1969) On events and event-descriptions. In Margolis, J. (ed.) *Fact and Existence*, pp63-74. Oxford: Basil Blackwell.

McConnell-Ginet, S. (1982) Adverbs and logical form: a linguistically realistic theory. *Language*, **58**, 145-184.

McFetridge, I. G. (1976) Propositions and Davidson's account of indirect discourse. *Aristotelian Society Proceedings*, 131-145.

Moens, M. (1987) Tense, Aspect and Temporal Reference. PhD Thesis, Centre for Cognitive Science, University of Edinburgh.

Moore, R. E. (1979) Refraining. *Philosophical Studies*, **36**, 407-424.

Nagel, T. (1973) Rawls on Justice. *Philosophical Review*, **82**, 220-234.

Parsons, T. (1970) Some problems concerning the logic of grammatical modifiers. *Synthese*, **21**, 320-334.

Parsons, T. (1980) Modifiers and quantifiers in natural language. *Canadian Journal of Philosophy*, Supplementary Volume **6**, 29-60.

Parsons, T. (1985) Underlying Events in the Logical Analysis of English. Chapter 16 in *Actions and Events*: *Perspectives on the Philosophy of Donald Davidson.* Oxford: Basil Blackwell.

Passmore, J. (1985) *Recent Philosophers*: *A supplement to "A Hundred Years of Philosophy"*. London: Duckworth.

Perry, J. (1979) The Problem of the Essential Indexical. *Nous*, **13**, 3-21.

Platts, D. (1979) *Ways of Meaning.* London: Routledge and Kegan Paul.

Putnam, H. (1973) Meaning and reference. *Journal of Philosophy*, **70**, 699-711.

Putnam, H. (1975) The Meaning of "Meaning". In Gunderson, K. (ed.) *Language, Mind and Knowledge*, Volume 7. Minnesota: University of Minnesota Press.

Quine, W. V. O. (1951) *Mathematical Logic.* New York: Harper and Row.

Quine, W. V. (1960) *Word and Object.* Cambridge, Mass.: MIT Press.

Quine, W. O. (1969) Ontological Relativity. In *Ontological Relativity and Other Essays.* New York: Columbia University Press.

Rawls, J. (1972) *A Theory of Justice.* Oxford: Oxford University Press.

Reichenbach, H. (1947) *Elements of Symbolic Logic.* London: Macmillan.

Richards, B. (1976) Adverbs: from a logical point of view. *Synthese*, **32**, 329-372.

Rorty, R. (1980) *Philosophy and the Mirror of Nature.* Oxford: Basil Blackwell.

Rorty, R. (1986) Pragmatism, Davidson and Truth. Chapter 18 in LePore, E. (ed.) *Truth and Interpretation: Perspectives on the philosophy of Donald Davidson*, pp333-355. Basil Blackwell.

Rovane, C. (1986) The metaphysics of interpretation. Chapter 23 in LePore, E. (ed.) *Truth and Interpretation: Perspectives on the philosophy of Donald Davidson*, pp417-429. Basil Blackwell.

Rumelhart, D. (1975) Notes on a Schema for Stories. In Bobrow, D. G. and Collins, A. M. (eds.) *Representation and Understanding: Studies in Cognitive Science.* London: Academic Press.

Rumelhart, D. E. (1980) Schemata: The building blocks of cognition. In Spiro, R. J., Bruce, B. C. and Brewer, W. F. (eds.) *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence, and education..* Hillsdale, N.J.: Erlbaum.

Schank, R. C. and Abelson, R. P. (1977) Scripts, Plans, and Knowledge. In Johnson-Laird, P. N. and Wason, P. C. (eds.) *Thinking*. Cambridge: Cambridge University Press.

Schank, R. C. and Abelson, R. (1977) *Scripts, Plans, Goals and Understanding*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Schmidt, C. F., Sridharan, N. S. and Goodson, J. L. (1976) Recognizing Plans and Summarizing Actions. In *AISB summer conference 1976*, 1976.

Searle, J. R. (1980) The Intentionality of Intention and Action. *Cognitive Science*, **4**, 47-70.

Searle, J. R. (1983) *Intentionality*: *An essay in the philosophy of mind.* Cambridge: Cambridge University Press.

Siegel, M. (1979) Measure Adjectives in Montague Grammar. In Davis, S. and Mithun, M. (eds.) *Linguistics, Philosophy and Montague Grammar*, pp223-262. Austin, Texas: University of Texas Press.

Stich, S. (1983) *From Folk Psychology to Cognitive Science*: *The Case Against Belief.* Cambridge, Massachusetts: MIT Press.

Talja, J. (1985) On the Logic of Omissions. *Synthese*, **65**, 235-248.

Tarski, A. (1932) The Concept of Truth in Formalised Languages. In *Logic, Semantics, Metamathematics*. OCP.

Tarski, A. (1944) The Semantic Conception of Truth. *Philosophy and Phenomenological Research*, **4**, 341-375.

Taylor, B. (1980) Truth-theory for indexical languages. Chapter 10 in Platts, M. (ed.) *Reference, Truth and Reality*: *Essays on the philosophy of language*, pp182-198. London: Routledge and Kegan Paul.

Taylor, B. (1985) *Modes of Occurrence: Verbs, Adverbs and Events.* Blackwell.

Thalberg, I. (1977) *Perception, Emotion and Action: A Component Approach.* Oxford: Basil Blackwell.

Thomason, R. and Stalnaker, R. (1973) A semantic theory of adverbs. *Linguistic Inquiry*, **7**, 195-220.

Thomason, R. H. (ed.) (1974) *Formal Philosophy: Selected Papers of Richard Montague.* New Haven, Conn.: Yale University Press.

Thomson, J. J. (1971) The time of a killing. *Journal of Philosophy*, **68**, 115-132.

Thomson, J. J. (1977) *Acts and Other Events.* Ithaca, N.Y.: Cornell University Press.

Tuomela, R. (1977) *Human Action and its Explanation: A study on the philosophical foundations of psychology.* Dordrecht: D. Reidel.

Tye, M. (1979) Brand on event identity. *Philosophical Studies*, **35**, 81-89.

Vallacher, R. R. and Wegner, D. M. (1985) *A Theory of Action Identification.* LEA.

Vallacher, R. R. and Wegner, D. M. (1987) What do people think they're doing? Action identification and human behavior. *Psychological Review*, **94**, 3-15.

Vendler, Z. (1967) Verbs and times. Chapter 4 in *Linguistics in Philosophy*, pp97-121. Ithaca, N.Y.: Cornell University Press.

Vermazen, B. and Hintikka, M. (eds.) (1985) *Essays on Davidson: Actions and Events.* Oxford: Clarendon Press.

Vermazen, B. (1985) Negative Acts. Chapter 6 in Vermazen, B. (ed.) *Essays on Davidson: Actions and Events.*

Wallace, J. (1971) Some logical roles of adverbs. *The Journal of Philosophy*, **68**, 690-714.

Wallace, J. (1972) Positive, Comparative, Superlative. *Journal of Philosophy*, **69**, 773-782.

Wegner, D. M. and Vallacher, R. R. (1986) Action Identification. Chapter 18 in Sorrentino, R. M. and Higgins, E. T. (eds.) *Handbook of Motivation and Cognition: Foundations of social behavior*, pp550-582. The Guilford Press.

Weinstein, S. (1974) Truth and Demonstratives. *Nous*, **8**, 179-184.

Wheeler, S. C. (1972) Attributives and their Modifiers. *Nous*, **6**, 310-334.

Widerker, D. (1988) Action Sentences. *Erkenntnis*, **28**, 269-291.

Wiggins, D. (1985) Verbs, adverbs, and some other modes of grammatical combination. *Aristotelian Society Proceedings*, 273-304.

Wilensky, R. (1983) *Planning and Understanding: A Computational Approach to Human Reasoning*. Reading, Mass.: Addison-Wesley.

Wittgenstein, L. (1953) *Philosophical Investigations*. Oxford: Basil Blackwell. Translated by G E M Anscombe.

Wittgenstein, L. (1981) *Zettel*, 2nd Edition. Oxford: Basil Blackwell.

Zeevat, H., Klein, E. and Calder, J. (1987) An Introduction to Unification Categorial Grammar. In Haddock, N. J., Klein, E. and Morrill, G. (eds.) *Edinburgh Working Papers in Cognitive Science*, Volume 1: *Categorial Grammar, Unification Grammar, and Parsing*.